



February 1989

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Archive

The Subscription Magazine for Archimedes Users

Eureka II is On-line

Unix Workstation Revealed

Hard Disc Backup & Filetypes Utility

Using Hard Discs

Logistix – Charts & Macros

Reviews: ABC 2, Startrader, WordUpWordDown,
AlphaBase, Drawing Board, Reporter, MoneyCare,
Eizo monitor, Shares & Accounts, Template Editor

Sorry for the delay!

Several of you are waiting for replies to letters that you have written to us at Archive – some even from before Christmas! I'm sorry about that, but things have got rather hectic recently. It's partly because we received so many order for software and hardware over the Christmas period and partly because of all the articles, hints and tips, shareware programs and questions you've been sending in. I'm not complaining, honest, and please don't stop sending them. We are beginning to catch up now because we've got a bit more help in the office...

Let me introduce to you **Brian Ashton**, a very good friend of ours, who is helping us out at the moment. He's definitely 'into' electronics and computing – has been for a good number of years – but he has only just started to play with the Archimedes so he won't be able to answer detailed technical enquiries just yet, but he learns fast!

Better discs, same price!

We've managed to buy even better quality discs for sale to members. Larger quantities enable us to get better prices, so we've now gone up to TDK discs but are selling them at the same price: £16 for 10.

Top quality program discs?

We've had one or two problems with our program discs – one batch of 2.3's went out with broken directories. (Ironic, isn't it!?) – that was the one that had the disc recovery program on it!) Actually, it wasn't a fault with the discs; it was a hiccup in the copying program which meant that it didn't copy all the tracks. However, we have had one or two discs giving disc errors, so we are moving over to using best quality TDK's and again, there's no price increase.

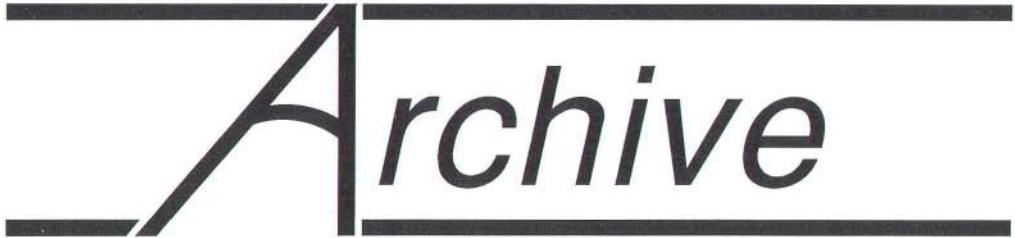
Thanks again!

I know you're going to get fed up with me saying this, but I do want to say thank you again to all the folk who help to make Archive what it is. It is very much a team effort and wouldn't be possible without all your contributions (which is why I feel so bad about all those unanswered letters).

I know Brian would want to join Sue and me in thanking God for the way He helps us and provides for all our needs.

Thanks again,

A handwritten signature in black ink, appearing to read "Paul B.", is positioned below the typed name and address.



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Hardware & Software Available

- **Acorn Languages** – Release 2 of Fortran 77, Iso-Pascal and ANSI-C are all available now from Acorn at the same price as before – £99 + VAT (or through Archive at £99 inclusive). If you already have release 1 and want an upgrade, send the original disc (just the disc and not all the documentation) with a cheque for £30 to Acorn Direct, Studland Road, Kingsthorpe, Northampton, NN2 6NA. (N.B. This offer is only open until April 1st 1989.) (N.B.2 The symbolic debugger, which forms part of the Software Developers Toolbox, will only work with release 2 languages.)
- **Arc P.C.B.** from Silicon Vision Ltd. is now NOT going to be available in the cheaper non-auto-routing version. It is however still available as the full package at £195 (£170 inc. through Archive).
- **Arcade 3 Compilation** from Clares Micros £14.95 (£14 through Archive). This consists of Mazey Man (a derivative of Snapper), Bounce-a-Ball (an Arkanoids game like breakout) and Zarcon Invasion. We have a review copy and it looks good value except that it does not, at the moment, work on computers that have a Computer Concepts ROM module installed. (I've asked Dave Clare and Charles Moir to see if they can sort it out!)
- **Arcendum** from Dabs Press £14.95 (£14 through Archive). Draughts, Reversi, 4 in a row and Backgammon. Play against the computer or someone else. We've got a copy for review – looks good.
- **Archway** from Simtron is a set of tools for handling the WIMP environment. For £79.95 inc VAT, you will get 4 x 800k unprotected discs and a 300 page ring bound User Guide, although it is not actually available yet. Version 1.1 for RISC-OS "will be available in May" and will be 5 discs and will cost £99.95.
- **Bumper Pack 2** – £19.95 from HS Software – five entertaining English and Number games plus a complete package of programs for designing, solving and printing your own crosswords (includes 20 ready-made crosswords). The games are suitable for children 5 – 12 and the crosswords package is also suitable for adults. (RISC-OS compatible)
- **Digi-Sim** – from Musbury Consultants will be available "mid-February" costing "round about £45". (Archive will be stocking it, ring to confirm price and availability.) It consists of a program that simulates different logic circuit elements including an unlimited (really?!) number of gates. Circuits are made by dragging gates onto the screen and then wiring them up using the mouse and pointer. When the circuit is completed, the diagram is animated, wires change colour to indicate the logic level on them, LED's glow red, 7-segment displays change to reflect their logic inputs. Also included is a logic tutorial program.
- **EpBAS** – Extended Precision in BASIC (see Archive 2.3, page 2). Abacus Training have responded to suggestions for improving their software for extended precision within BASIC. Version 2.00, which is still £30, is available for existing users on a free disc-for-disc upgrade and gives extra functions such as factorial, binomial coefficient, hypotenuse (i.e. square root of the squares of two numbers – particularly useful for crunching complex numbers as in Mandelbrots), hyperbolic and inverse hyperbolic functions, degrees to radians and vice versa.
- **Extended Pipedream?** Aarow Software have set up an impressive sounding system for the small business user (or big private user?) of Pipedream to keep track of letters, send mailshots etc at the press of just a few buttons. £23 inclusive. For more details, contact Graham Hobson, 0705 511056. (We are hoping to get someone to try it out.)
- **Fireball** – Arcade game from Go-dax Entertainment £19.95 (£18 through Archive). Basically a "brickout" type game but with 100 screens to get through! Eight different colours of bricks with different points scores plus five special types of bricks that do different things. You can edit the screens and change the order in which they appear. The bricks also throw out different types of bonus objects which you can use if you can catch them without missing the ball.
- **First Word Plus Extended Dictionary** – 80,000 words plus specialised supplementary dictionaries, only £6.95 inclusive from Science Frontiers.
- **Fish** – Adventure game from Magnetic Scrolls, £24.95 (£23 through Archive). Review next month.

- **GreyDumps** from Musbury Consultants, £15, (£13 through Archive) is a graphics tone dump for Epson FX80 or compatible printers.
- **Hearsay upgrade** – version 1.06 of Hearsay includes, amongst other things, the possibility to edit the call bands (this is of particular use to those who are not BT subscribers, i.e. those outside the UK) and improved modem initialisation on start-up. Call Beebug for the cost of the upgrade – "Should be about £5".
- **Hyperbook** from Logotron (of Logo fame) is an on-screen book-researchers tool £49 + VAT. It allows you to read specially prepared books on screen (with prices varying from £10 to £25) and to create indexes, glossaries and cross-references.
- **Macro Assembler Version 2** from Wingpass Ltd (£49.95) takes ARM assembly language files and produces AOF files for linking with similar files from high level compilers.
- **Numerator**, also from Logotron, is a maths teaching package, £69 + VAT, which aims to tackle pupils' conceptual difficulties by the use of construction models on screen.
- **Oak Computers** have various new goodies for Archimedes users – a 20" hi-res multi-sync monitor (£1495), a 47 Mbyte winchester upgrade for the 440, a range of external winchester drives (20, 40 or 47 Mb at £300, £499 and £599 respectively) and an interface for their PDT allowing the import and export of DXF and HPGL files and the export of IGES files (£149).
- **PipeDream under RISC-OS** – contrary to reports from Bruce Smith in A & B Computing, Pipedream does work under RISC-OS. There is no need to up-grade beyond the current 2.0 version.
- **SolidCAD** – 3D draughting system £49.95 (inc VAT & carriage) from Silicon Vision (£46 through Archive). Allows drawings to be done in 3 elevations with a 3-D projection to aid visualisation. Realtime Solids modeller, which includes SolidCAD, allows animation of objects created by SolidCAD. £89.95 (£79 through Archive).
- **System Delta Plus Version II** (System Delta Plus Plus?). This new version (£79.95 inc VAT or £69 through Archive) will now work on RISC-OS and has 'many up-dated features' and they have improved the manual. Minerva say, "Existing System Delta Plus users need not worry as a disc will be provided to enable them to run the current version of SDP with the new RISC-OS.", but there is no mention of the cost. Version II will be released when existing stocks expire, anticipated date – end February 1989.
- **Thundermonk** – the latest games offering from Minerva should be available by the end of February, £14.95 (£14 through Archive). Sounds from the press release like a maze game but one in which you can cheat by walking through walls!
- **Timetabler** – the latest "serious" offering from Minerva should be available by the end of February. No price set as yet. It will "reduce the time spent on preparing school, college and university timetables from weeks to minutes. It is unbelievably fast and powerful, taking around 10 minutes to produce the timetable for the largest school in England!"

Review Software Received...

Apart from reviews already written, we have received copies of the following software: Bumper Pack 2, Arcade 3, Arcendum and Fish.

The Order Form grows...

There is more and more software and hardware available now for the Archimedes, and a lot of it is available through Archive at a discount.

We are working on a deal to offer Computerware hard disks. The prices should be finalised by the time we print the order form (which goes to the printers a week after the magazine itself) so check the order form for prices and availability. Overseas Archivists should note that we have been told that the drives, having been imported from the States, must not be re-exported. However, you can buy the podule separately and it comes with all the metal-work for mounting the drive. All you then need to do is to buy a bare 3.5" drive from your local suppliers.

You will note too that we have increased some of the discounts, especially on the more expensive software. This is partly because, with larger quantities, we've been able to get better discounts but it is also because the actual margin we would make on larger items of software is rather more than on, say, a £14 game and the amount of work involved in ordering and despatching it is about the same. A

Comment Column

- **GammaPlot versus Presenter** – A postscript to my comment in the December issue of Archive. Naturally I returned GammaPlot to the suppliers as unsuitable for my needs. However at the Micro User Show I purchased a copy of Presenter and I am pleased to say that this product meets my needs. It overcomes all the criticisms of GammaPlot though it still does not give all the flexibility of Easel with regard to labeling. It does work in MODE 20 and it is written in BASIC V so it can be tailored (at the user's peril) to individual needs. No problems at all were encountered in accessing a variety of disc drives; I use two at 3.5" and one 5.25".

In use, without modification and being quite new to the product, I prepared all the graphs for my last technical paper in about an hour. The manual is not impressive but is more than adequate, particularly as the program is so well written that it requires hardly any reference to it. The quality of picture obtained was superior to any I have obtained from my previous efforts with a wide variety of computer systems. Plenty of flexibility is built in to enable changes in scale, margin widths and colour. In addition to line graphs it is possible to produce both pie and bar charts. Even so, improvement is possible, if required, as a facility is provided to save screens, which can be modified by one of the many graphics packages readily available.

Needless to say, I'm well pleased. I not only have a good graph preparation program but am £40 richer.

In conclusion, I should say that, bearing in mind Minerva's comments in the December Editorial, the only comparison intended between Euclid and GammaPlot was on the quality of software. If my comments also suggest that few "professional" reviewers know what they are talking about and actually use the programs that they review in earnest; then so be it!

Brian Oliver

- **System Delta Plus** – Just as Brian Oliver on GammaPlot, I find System Delta Plus excessively complex. Having to enter the original disc each time during loading has been a source of annoyance for me too. I have been playing about with an illegal copy of Pipedream with no manual* and have found

that far more pleasant to use. Obviously you cannot get the results that can be achieved with SDP nor do you get the colourful graphics or mouse control but Pipedream does offer wordprocessor and spreadsheet facilities, and the fact that its files are memory based rather than disc based is no problem for me so I am now saving up to buy Pipedream and thus obtain a manual and make an honest man of myself again.

P Green, Rotterdam.

*Don't worry Rob, Philip bought a copy of Pipedream from us last week! Ed.

- **SuperDump from Silicon Vision** produces very good high resolution graphics dumps on an 9-pin Epson printer and it allows a drawing to be scaled to any size prior to dumping, but it has one major draw-back. Although it manages the graphics output remarkably well and produces smooth curves and lines at any angle, no alphanumeric text of any kind is output. Silicon Vision confirmed that this is so but said that you could roll back the paper and over print it with the words you wanted! They also said that there may be an enhanced version later allowing the output of vector-drawn characters. For what you get, therefore, I feel that the price is exorbitant.

Leslie Hay, Kincardineshire.

- **RISC-OS** – I have RISC-OS running in my machine and would like to point out that it is not a true multi-tasking operating system but rather a concurrent system based on the principle of task swapping. It only works by courtesy of the application passing back a "nothing to do" signal to the WIMP system. A true multi-tasking system would "nick" control from any one program after its time was up. Also, all programs running would be in their own memory space, each being able to operate totally independently of any other task. There are not many true multi-tasking operating systems that are implemented on micros

Mike Cook, Musbury Consultants.

- **Pipedream** – Various people have told you what Pipedream will do, so let me tell you what it does not do. (1) You cannot print the labels round the border of the sheet (2) There is no indication of whether you are in insert or over-type mode (3) There is no

quick sideways panning of the screen (4) There is no locking or protection of specific rows or columns (5) There is no indication of memory available.

Ronald Parsons, Surrey.

Robert Macmillan, Colton Software has the right of reply... (this is a precis of Rob's three page letter) (1) True, but most people don't want them. If you do, I can explain how. (2) Most people don't change I/O but you can find out what mode it is in with a single keypress, by defining <alt-f1> as NPSlM (3) I don't agree. Pipedream is faster than all the opposition (4) True (5) True – this is because it is written in C. If we had used BASIC, we could have provided that facility, but who would use BASIC to write a major application like Pipedream?

- **Shareware Discs** – I am very disappointed by your Shareware disks. The problem is not the quality of the programs, which are, in places, elegant, but the fact that they are poorly, or indeed totally un-documented. When I buy MS-DOS Shareware, I find a very high quality of documentation, amounting often to 25-50% of the disk and this is also the case for David Pilling's disks, and also RISC Users' disks.

There are two classes of problems: the first is access to varying data, which enables choices to be made; an example in LIFE is the inaccessibility of the set of names of available patterns to load without breaking out of the program. The second is more serious. There is no description of how to use the utilities. I found myself totally unable to use the DFS/ADFS utility, since I had no way of securely knowing what to do and, in particular, I did not know whether it was possible to save as DFS on a disk that was actually ADFS, a catastrophic action that I have encountered on other systems.

I think you have been thinking of the kind of use that would be made of your original delightful display demos, and have not rethought the kind of packaging that utilities require if they are to be accessible without external printed documentation.

J Laski, London.

Paul Beverley, Norwich Computer Services has the right of reply... The £3 you pay for our Shareware discs covers the cost of the disk, admin and p & p, with not a lot left over (when you take off the VAT

as well!). The quality of the documentation is therefore entirely in the hands of the contributors. True, we could refuse to pass on anything that was not expertly written and did not have copious documentation, but I suspect there would be not much left.

I have also been told that they have been mis-named – they are really public domain discs, not true shareware, i.e. (most of) the programs do not contain requests to send money to the authors if you want to use the programs seriously. Still, it's a bit late to change now. "Shareware Disc 4" is in preparation now, but we still need a few more programs to fill up the disc. Please keep them coming, they are appreciated by many people. (Or are they?)

- **PC Emulator Star Commands** – Don't think that I am going to tell you how to issue star commands from within the PC emulator – I'm not! After reading this you should be convinced of the desirability of such a facility, and some keen programmer may write us an EXE file to provide it.

In my experience of using the PC emulator (which I must admit, is rather limited) there are a number of occasions where the issuing of star commands is vital. The most important of these relates to issuing the *FLOPPIES command.

It turns out that MS-DOS is rather intelligent in the way it performs file copies from one disc to another. However, when using the internal 3.5" disc drive together with external 5.25" drives you can get into trouble. In Arthur/RISC-OS using one floppy you would copy from one disc to another by requesting a copy from disc :0 to disc :0, using the P option to prompt for disc changes. In MS-DOS, you do this by telling the machine to copy from drive A: to drive B: even though there is no second drive. The machine recognises that there is no drive B: present, uses drive A: as both drives and issues the required prompts to change discs.

Trouble can occur when the only external drives are the 5.25" type, since you can't then copy from one 3.5" disc to another 3.5" disc. Using a copy from A: to B: will copy to the 5.25" disc. The only way round this problem is to configure the Archimedes for one floppy. But if you do that you can't then use the 5.25" disc drive.

Comment Column

At present the only solution is to exit the emulator, change the configuration and then re-enter the emulator. This can be extremely inconvenient.

Users of the BBC Master 512 will recall that within Acorn's version of DOS Plus. there is a command called simply "star". Using this, you have access to the machine operating system just as you would when using the machine in its native 6502 mode. Clearly what is needed is an equivalent MS-DOS command in the emulator. Implementation would be as an EXE file which would sit with the rest of the MS-DOS files. Unfortunately, to write such a program would require knowledge of the workings of the emulator, but there must be someone out there who would like to take a crack at it.

Brian Cowan, London.

Beware the backplanes!

Acorn have all along refused to approve second-sourced backplanes. They have insisted that for noise and power supply reasons, they had to be four layer boards. (The middle two layers carry the

power supply to all parts of the board and provide electrical screening.) Some people reckoned it was Acorn being petty or simply trying to keep hold of the market, but a brief conversation with Charles Moir, boss of Computer Concepts, has proved to my satisfaction at least, that this is not so.

Apparently, the Fax Pack (which they are hoping to make available in February) works perfectly on the Acorn backplane but does not work properly on some of the four-slot back-planes. The reason is that it uses very close to the maximum allowable current and the power-supply tracks on the boards are just not thick enough and produce too much of a voltage drop. I.F.E.L. say that they are going to do a four-layer version of the board (which will presumably be more expensive). Atomwide say they have plugged in the fax card and filled up the backplane with other cards such as the Watford Digitiser and it seems to be OK. However, they say that as a matter of course, if you did have problems, they would make any necessary modifications. (The Atomwide backplane is the one that Archive stocks.) Ed. A

Archimedes Macro Assembler Version 2

The Wingpass Archimedes Macro Assembler takes ARM assembly language source files and produces Acorn Object Format (AOF) files suitable for linking with other AOF files produced by a high level language compiler.

Features:

- * Accepts the full ARM instruction set including Floating Point instructions. All FP data types (Float, Double, Extended and Packed) are supported.
- * Allows 'C' language header files to be included so definitions of structures, unions and #defines need only be done once.
- * Powerful macro facility includes parameter specification by position or by name, parameter defaults and variable length parameter lists.
- * Example files supplied include: routines calling and called from 'C' routines obeying the calling standard, example relocatable module, complete Mandelbrot set program.

£ 49.95 (inc. VAT and P&P)

Wingpass Ltd, 19 Lincoln Ave, Twickenham, MIDDX TW2 6NH

Now available

£105 from Archive

PipeDream

PipeDream is now available on the Acorn Archimedes. It provides comprehensive word processing, spreadsheet and database facilities integrated in a way only dreamed of before.

With other integrated packages, you have to divide your work into artificial sections, such as text, numbers and calculation, and database.

With PipeDream, you compose your work in the order you want to print it, with text and numbers all together in one document. Incorporate calculations directly into paragraphs of text and formatted paragraphs directly into spreadsheets.

PipeDream is ideal for all tasks involving words and numbers. From writing thank-you letters to encyclopaediae, invoices to cash flow forecasts, stamp-collection records to inventory management, film scripts to mail-shots.

PipeDream is 100% file and keystroke compatible with Z88 PipeDream and PipeDream on the IBM PC. It is also compatible with View Professional on the BBC microcomputer. You can create documents on any of these computers, transfer the files to any other and continue working, with no loss of information. No other software enables you to share your files with all these computers.

PipeDream for the Acorn Archimedes costs £99 + VAT.

It is not possible to detail all of PipeDream's facilities here. For full details or to order PipeDream call us on 0954 211472 or write to us at Colton Software, Broadway House, 149-151 St Neots Road, Cambridge CB3 7QJ.

PipeDream - power at your fingertips.

Hints and Tips

• **How to wipe a disc clean** – Having explained in H & T in issue 2.1 how to use *LIB "" and *WIPE * ~C to wipe a disc clean, here is the really quick way! Take a blank disc and do a *BACKUP onto the disc to be purged – takes about 10 seconds all together, even with only a single drive!

• **Microlink Modem connections** – We have at last sorted out the connections necessary for the Microlink Multispeed modem. The problem is that it seems to need two different connections depending on whether you are using ArcTerm or Hearsay. Anyway, here are some connections that seem to work OK. ArcTerm version first:

Modem	Computer
GND	1 }— 5 GND
GND	7 }— 5 GND
RXD	2 — 3 TXD
TXD	3 — 2 RXD
RTS	4 — 7 RTS
CTS	5 — 8 CTS
DSR	6 —{ 1 DCD
DTR	20 — 4 DTR

Note that the Archimedes DCD is not connected to the modem DCD but to the DSR to ensure that it is ON all the time. The modem DCD is only ON whilst on-line. Here are the Hearsay connections:

Modem	Computer
GND	1 }— 5 GND
GND	7 }— 5 GND
RXD	2 — 3 TXD
TXD	3 — 2 RXD
RTS	4 — 7 RTS
CTS	5 — 6 DSR
DSR	6 (NC)
DTR	20 (NC)
DCD	8 — 9 RI 1 DCD} 4 DTR} linked 8 CTS)

• **BBC Hard Discs** – If you have BBC hard discs that use the 1 MHz bus, you can run them on the Archimedes under the new 6502 emulator,

"65host", that comes with RISC-OS. All you do is enter 65host and load the BBC 1770 ADFS then, assuming you have an I/O podule, connect the hard disc to the 2 MHz bus and away you go.

(*Surely it wouldn't be too difficult, would it? to patch it into the existing operating system to make the hard discs accessible in native mode instead of limiting it to use with the emulator? Could anyone do that for us? Ed.*)

• **Naff RTC Month** – If you get this error message when running the desktop, the chances are that it is time to change your batteries. Acorn suggest changing them once a year.

• **Repton 3** – first a comment – The characters included are exactly the same as in the BBC version even though they are mode 9, so it looks like mode 5 on the BBC. This is disappointing as the extra resolution and colour are wasted unless you redefine the characters – a mammoth task as there are 768 altogether! (Phil Armstrong, Doncaster)

Phil also says... I redesigned the first 48 characters which took quite some time and I did encounter a few problems, namely my maps occasionally were wiped or the start position changed. To get round this problem, I examined the data files and found:

&0000 to &10A0 8 Map definitions and colours for each map

&10A0 to &70A0 48 character definitions

So if you lose your maps or wish to copy a character set to another set of maps, follow these operations:

*Load Newdata 10000 load new characters as saved by editor

*Save Char 110A0 170A0 save character set alone

*Load Olddata 10000 load file containing required maps

*Load Char 110A0 overlay new character set

*Save Newfile 10000 170A0 save maps and characters together

Newfile can then be loaded into the game. Changing characters does not seem to affect the competition numbers the game gives you.

- **Games on the 440** – Many games programs will not run on the 440 if the screensize is set above 160k, so you should try *Configure Screensize 5 before running the game.

- **Pacmania** – Two avid “Pacmaniacs”, Harjit Takshak and Linus Twizell, have provided some Pacmania hints:

Do a *LOAD PACMANIA 10000 then you can set the number of lives with ?&102C8 = n (but too many slows the games down) and ?&113D4 = n sets the number of points per pill and ?&10234 = n sets the number of credits and then CALL &10000 starts off the game.

- **GammaPlot** – It is possible to change the colour of a line on a line graph by using the command *SG17,n,128 where n is the GCOL number (e.g. 48 = blue). This command can also be used in the Macro mode followed by a line with GRAPH (just the graph) or CHART (graph and axis). The colour will be saved, along with the graph, to disc.

- **Printer problems** – there have been one or two problems with spurious operation of printers, especially with Integrex printers when doing graphics dumps. These are caused by timing problems on the Archimedes' parallel port control lines and can be solved by an internal circuit board modification that Acorn have recognised as a field change, i.e. if you are having problems, go to your local Archimedes dealer and ask if he can do field change 2002 for you. (D.I.Y. field changes will void your warranty, but if you want details anyway, send us an S.A.E.)

- **Conditional booting** (cf Archive 2.3, page 13) Philip Colmer says that unfortunately *FX200,2 followed by reset is treated as a power-on reset so the monotonic clock is reset. Probably a better way is SYS"OS_Byte",253,0,255 TO break% where break% is 0 for soft break, 1 for power-on reset and 2 for a hard break – a bit more reliable than checking a clock value.

- **BCPL on ADFS** – J Laski writes... I am a BCPL freak: due to the fact that ADFS was not available when it was designed, the ROM system causes files to be read/written with OSBGET/PUT rather than OSFILE/OSGBPB; also, intermediate files in the compiler and editor use names such as Backup\$ which ADFS abhors.

To get round this, patch the routine in the ROM (image disk) FSTYPE (G39) always to return 7 (see manual p117). In both BCPLARG and BCPLCCG, patch the second static load (LLL) in G1 from “OCODE\$\$” to “OCODE!!”. In ED, in G318 patch the static load in G318 about 40 words before the SWL near the end of the routine; this can best be found by looking for the long forward jump about 30 Cintcodes from the beginning. (N.B. I use an extended ED, so have only given rough positions; G318 is the last routine called from G1.)

If you feel you cannot make these changes yourself, and send me a disk with proof that you have a legal copy of BCPL and a stamped self-addressed mailer, and I will send you a modified version. I would appreciate, but do not insist on, any utilities that you think might amuse me.

I am seeking a version of BCPL in ARM code and, if ACORN cannot be persuaded to release their version, will do it myself, probably somewhat ‘adhocly’. If you have any views on desirable facilities, I should be glad to read them. I shall shareware distribute with a licence fee requested. (Dr J Laski, 18 Ebury Street, London, SW1W 0LU.)

- **“Colour Printouts – The Easy Way”** – I read with considerable interest the article by W R (Basil) Davis on taking 35mm photographs of the monitor screen. (Archive 1.9, page 52) I was able to put this to practical use recently since I wished to design and produce some graphics screens (using GammaPlot) and use these in a conference presentation. I did consider using acetates with an overhead projector, but decided 35mm slides would be more suitable.

The following additional comments (which should be read in conjunction with the original article) may assist other Archive readers contemplating taking such pictures:

- 1) Before embarking on photographing any screen displays, it is important to remember that any apparently minor “blemish” will be magnified

considerably if your results are being projected using 35mm slides. Careful thought should be given to the screen layout and the choice of colours; provided they don't clash, brighter foreground colours are preferable, with black or a dark blue making an ideal background. The normal Archimedes text is quite visible when projected using 35mm slides; additionally I used a GammaPlot feature to enlarge the standard text for titles etc. and, whilst this was quite acceptable on a monitor screen, when projected it did appear noticeable "chunky". Next time I will use the Archimedes special fonts with GammaPlot instead.

2) In choosing the 35mm film to use, one important consideration may be the speed with which you wish the results to be returned to you. Whilst most colour print films can be developed overnight or even within an hour or so, this is not the case with colour slide films. Most have to be sent away for processing and a delay of 10–14 days is not untypical. If you want colour slide film developed quickly it is best to use (non "process paid") Kodak Ektachrome film which good photographic shops should get returned to them within 2–3 days. There are also a few specialist laboratories which offer a 2–3 hour service.

3) When determining the correct 'peak white' exposure using an automatic camera, it is possible for the camera's metering system to be too sophisticated! I was using a Minolta 7000 AF camera and the exposure settings fluctuated quite rapidly as the monitor screen picture was scanned and refreshed. Checking the exposure using a different camera confirmed the article's "if all else fails" assumed exposure settings.

4) Focusing may well be perfectly feasible when using a camera with auto-focus. I found it best to set the initial focus with a screen display visible, rather than a blank screen, and then switch the auto-focus off – this is because the Minolta 7000 AF system tries to refocus after every picture is taken. In setting the combination of shutter speed and aperture, it is probably preferable to err towards the slower shutter speed/smaller aperture (higher 'f' number) setting as this will increase the 'depth of field' and give a greater safety margin if the focusing is not quite right.

5) As mentioned in the original article, a sturdy tripod is virtually essential and a remote shutter release (or possibly the camera's Delayed Action feature – if fitted) must be used to avoid camera shake and consequent blurred pictures. Additionally, switching off the room lights when taking the photographs should avoid any extraneous reflections off the monitor screen possibly spoiling the finished results.

6) If you are using 35mm slides and the results are to be projected using a professional (rather than domestic) slide projector, it is definitely worthwhile having the slides 'glass mounted' – although this does increase the cost! This prevents the heat from the projector lamp "popping" the slide and causing part(s) of it to appear out of focus. For those who are interested in further reading on the subject, there is an article in January 1989's issue of BBC Acorn User (pages 81–83) on the subject of taking photographs of the computer screen, there is even advice on taking pictures of commercial games software.

Rob Brown. A

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Help!!! – Needed and Offered

Help Needed

- **Area Measurement** – Does anyone know of a program for the Archimedes to measure areas on paper maps using the mouse like a planimeter? J Brattle, Barnham.

- **Hardware articles** – Brian Cowan's hardware articles are most welcome, but I'd like to see a lot more hardware information published. For example, constructional projects or how to do your own up-grades. James Johnson, Swindon.

(Yes, I'd like to publish constructional projects. Would anyone be interested to do something for us using an Atomwide Expansion podule? Ed.)

- **Shadow screens on the A440** – We still haven't managed to get William Doggett's Mandelbrot program working properly on the A440 and we've had one or two enquiries about other programs using shadow screens not working properly on the A440. It almost looks as if there is something different about the way the 440 works compared with the 300 series. Any ideas, anyone? (*Could the hint on page 9, which has only just arrived, be the answer?*)

- **Computerised Index** – Anyone fancy putting some work into setting up a disc-based index for Archive? There is a paper printout of an index for volume 1, but some folk would like to see a disc index, regularly up-dated. I don't know quite how it would work, but I'm open to suggestions. Perhaps we should use Eureka I or II? Or does that limit its availability too much? Ed.

- **Typing Tutor** – Does anyone know of a typing tutor for the Archimedes? P.D.Holden

- **Scanners** – Is there a scanner available for the Archimedes? CC's Fax Pack has a scanner and will be available without the modem for "around £449 + VAT", but that's still a bit expensive. Could any enterprising Archive reader write some software to run one of the scanners available (at around £200 – £300) for other computers? Stuart Forbes, H.S. Software and Richard Waldron, W. Midlands.

Help Offered

- **640 x 512 resolution** – There is a Public Domain disc available from CJE Micro's in Worthing (their ref. PD9) which includes some examples of high-resolution 640 x 512 graphics that can be displayed on a standard monitor. Whilst not understanding the detailed workings of the program, this feature is apparently created using an event whereby every 50th of a second the screen bank is swapped and, with interlace turned on, the effect is of higher resolution. There are also a number of other PD discs available from CJE Micro's, most of which cost £3 each (minimum order value £5) plus p&p.

- **Copy protection** driving you mad? We've had a lot of comments to the effect that people are being driven mad by copy protection which means you have to keep using your master disc. Stuart Bell offers a solution for System Delta Plus and SigmaSheet users. Send a blank formatted 800k disc (plus proof of purchase!) to the Archive office and we will send you a program(s) that will allow you to make a copy of your master disc(s). (If purchased through Archive, state date of purchase and quote the cheque number used for the purchase to help us trace the order.)

- **HP Laserjet** – Ian Copestake is working on software to drive the HP Laserjet, as requested last month, but apparently it's not an easy one to get to grips with!

- **Graphics dumps** – Tim Powys-Lybbe, author of the two articles about using Logistix, has a graphics dump module for the HP DeskJet printer. He would be interested in re-writing it for other printers if anyone wants to make any suggestions and could test the programs he produces.

- **Updated PD programs** – Paul Hobbs who has sent us various programs such as the cassette inlay printer for our shareware discs says that if anyone wants the updated versions of the programs they should send him a blank formatted disk and £1.50 for p&p. Paul Hobbs, 5 Amersham Avenue, Basildon, Essex, SS16 6SJ. **A**

Matters Arising

- **Pipedream.** Just to clarify one or two points from Gerald Fitton's article last month, the SpellCheck dictionary has 93,003 words including the word, "program" and the price is £49.45 (or £45 through Archive and Pipedream is now only £99 through Archive.)

More seriously, some of you may have seen Bruce Smith's article in the February edition of A & B Computing in which he said that the current version of Pipedream would not work under RISC-OS. This is not true. Pipedream 2.2 does work under RISC-OS, though it is true that Colton Software will be producing a special RISC-OS version to take full advantage of the multi-tasking environment. (OK, I know that the purists say it's not true multi-tasking, but it's a considerable step up from Arthur!)

- **Solidisk Teletext Adaptor** – Those of you who have been having problems will be pleased to hear

Solidisk's comments: "This problem has now been resolved. If any user, experiencing problems, would return his current diskette, with a copy of his receipt and a request to upgrade to the latest version, we shall be only too pleased to do so. Our sincere apologies are extended to all such users, and we do hope that such problems will not reoccur."

- **Author Revealed!** – The anonymous review of Pacmania last month was actually written by Lee Thake. Sorry about that, Lee!
- **Mono monitors on the 440** – Philip Colmer, Acorn Customer Services says he does not advise removing the connectors as suggested on page 12 in the December issue. "We can supply two links and a special connector to take the monitor lead and convert it to a BNC connector... totally free of charge!" Please write to Acorn Customer Services at Fulbourn Road, Cambridge, CB1 4JN. **A**

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Eureka II is on-line!

Alan Glover

Avid fans of soap-operas will no doubt have been following the saga of the Eureka bulletin board with considerable interest. To date it has consumed a number of hard discs, modems, computers and versions of the ACMB software. Despite the efforts of Carl and Roger, the system is still best described as 'temperamental' (and has often been described in more graphic ways when unable to get onto it!).

(To be fair, Alan, Eureka I is working better now than it has been for a while, but we understand (and share) your sense of frustration! Ed.)

How to get on to Eureka II

For those who can't wait to read the rest ...

- Eureka II – (01) 683 0629
- Word format: 8n1 (TTY)
- Speed: 300/300, 1200/75, 1200/1200 or 2400/2400
- On line: most evenings (initially)
- Archive registration keyword: Genesis (see below)

Eureka II is a completely new entity. It is being run in London (so that many people will be able to use b1 charged calls instead of b) and we are using an Archimedes 310 with hard disc using software which has already been proven reliable on an identical hardware configuration.

Eureka II follows the lead of Eureka in being both a general board for Archimedes owners as well as offering additional facilities to Archive members.

Initially, the board will assume that you are not an Archive member, so: (1) From the main menu select R (Archive registration). (2) Type in the key word from the current issue of Archive. A message will be displayed confirming your new status. This month's word for Eureka II is 'Genesis'. This procedure need only be performed once.

What software is needed?

There are three programs you will need to use Eureka II fully, the first is version 1.24 of the Acorn serial port fix, which irons out the problems in Arthur 1.2 with serial communication. It will not be needed with RISC-OS.

The second is a terminal program which is suitable for scrolling boards (Eureka II is scrolling text only and uses the full 80 columns!!!) and which allows Xmodem uploading and downloading.

Commercial programs such as ArcTerm 6.01 and Hearsay are ideal. However, for those on a tighter budget, there is a public domain program, ArcTerm 3.09 which may be obtained from the board in Xmodem or plain ASCII format. Of course there's a slight problem here – if you have no software, you can't get on the board to download it! (*How about we put them on this month's program disc? Ed.*)

To get around that, a copy of Arcterm 3.09 appears on this month's program disc, along with the ARC file compression program mentioned shortly.

If you have a BBC Micro then programs like CommStar or the Terminal program in the Master 128's OS ROM can be used to access the board initially and download Arcterm 3.09.

The other program is the ARC file (de)compression utility. This is another public domain program, maintained by Beebug. It allows several files to be combined into one file, with the constituent files being compressed to save space. This gives the user of Eureka II the advantage that in many cases they will only need to download one file, which in fact contains all the files needed for a particular application.

The downloaded file is then unpacked using ARC, producing the original files once again.

ARC can be downloaded from the board, along with its instructions. This approach both simplifies the task of collecting programs from the board and reduces the downloading time.

Two-way communication

The board is starting initially using an Amstrad SM2400 modem, which can handle:

- V21 – 300 baud bothway
- V23 – 1200 baud sending, 75 baud receiving (from you)
- V22 – 1200 baud bothway
- V22bis – 2400 baud bothway

In all cases, the word format is 8 data bits, 1 stop bit and no parity bit (8n1). The modem is also supposed to handle reverse V23, 1200 baud transmit and 75 baud receive – but I haven't got that working reliably yet, so use V21 for uploading for now (300 baud bothway).

Please do upload programs you've written – communication is supposed to be a two way process!

So, in the case of a user with a V21/V23 modem (e.g. Linnet and most dumb modems) you should use V23 for normal use and downloading files and V21 to upload files. I hope soon to offer reverse V23 too (1200 baud transmit, 75 baud receive to cut down uploading time for people without V22 or V22bis).

Software available?

Among the software which will be available from the board will be all the monthly program discs, shareware discs and the graphics demonstration disc. (*Over 9 Mbytes of data in uncompressed format! Ed.*) However bear with me – it will take some time to get all the files compressed and loaded onto the board.

There are seven file directories. The first four are available to any user of the board and the last three are only accessible by Archive registered users. As with other features of the board, this may be changed if another arrangement seems better – watch the initial bulletin list for details!

For now, the board will be live only in the evenings, so that it can be supervised during testing. Whenever the board is off, you will get unanswered ringing tone. The modem is set to auto-answer on the first ring, so if you don't get answered quickly, the board is off-air at the time.

These operating hours are temporary, to allow close monitoring of the board. Suggestions about preferred operating times are welcome and will be considered when choosing the final operating times. Please leave me a message on the board about that, or anything else that you notice or would like to see in the board software.

Modem Connections

Lastly, some notes about connecting a modem to the Archimedes. These hold true for the Microlink

MultiSpeed, Pace Linnet and Amstrad SM2400 modems, so should be a good starting point for other intelligent modems.

There are several points to bear in mind when connecting the modem to the Archimedes. The first is that the CTS control input to the Archimedes stops transmission instantly – i.e. at bit level not byte level. Hence CTS can corrupt characters and should not be used for flow control. This differs from the way CTS and RTS worked on the BBC, which was much more like the functions of DSR and DTR here.

The second is that intelligent modems indicate carrier detection by using the DCD line. However, at the Archimedes, the DCD line must always be ON in order to receive characters – so a direct connection of DCD is impractical (intelligent modems can be commanded by the computer whilst off-line).

However, communications software likes to monitor DCD to detect (loss of) connection. This can be achieved by using the RI input of the Archimedes which may be read by software and does not affect the data flow.

Finally, communications software likes to be able to clear a call by using the DTR line – which most intelligent modems support. So, my general purpose serial connection, which works on the modems listed above is:

	Modem (25 way D type plug)	Archimedes (9 way D type socket)
TxD	2 →	3 RxD
Gnd	1 }	5 0V
Gnd	7 }	
TxD	2 →	3 RxD
RxD	3 ←	2 TxD
CTS	4 →	6 DSR
RTS	5 ←	7 RTS
DSR	6 →	{ 1 DCD
DCD	8 →	8 CTS
DTR	20 ←	9 RI
		4 DTR

The direction of the signal is shown by the arrows to avoid the confusion usually caused by the pin names.

Thanks a lot!

Eureka II would not have been possible without the help of the SysOps of two other Archimedes related boards. Both are worth a visit.

ArcPort BBS (David Joyce) 0252-737065
(Farnham, Surrey)

The World of Cryton (Hugo Fiennes)
0458-47608 (Street, Somerset)

ArcPort BBS is free to use (apart from your phone bill!), but a £5 donation is invited towards maintenance of the download areas. Its operating hours (subject to downtime for system maintenance) are 6 p.m. until 8 a.m. weekdays and 24 hrs at weekends.

The World of Cryton has a compulsory £5 registration for access to the download areas. However you can just join the board for non-downloading use free. It is on line 24 hrs a day.

Both systems will support baud rates up to 2400 and work in a scrolling 8n1 TTY format.

Thanks, too, to Norwich Computer Services for supplying an Archimedes at trade price and for letting me have an Acorn hard disc upgrade on semi-permanent loan. A

Thanks to you, Alan, for your time and effort in setting up Eureka II. I'm certain that people have been waiting with varying degrees of (im)patience for a board that could be a centre for high-speed information interchange. Let's hope that Eureka II will be just that. Ed.

Contributors, please note...

If contributors want to send articles and/or programs in to Archive, you can up-load them in arc'ed or un-arc'ed format, to Eureka II and then every so often I'll log on and up-load them to the Archive office. Thanks. Ed.

ABC BASIC Compiler Version 2

Brian Cowan

You may remember I recently reviewed the Archimedes BASIC Compiler (ABC) from Dabs Press (Archive 2.3, page 27). On the whole this was a superb product although I did have a few minor reservations. Mainly, it was the lack of full BASIC V compatibility in the array handling facilities and the fact that the floating point calculations did not support double and extended precision arithmetic.

It seems that there are serious problems in implementing a compiled version of the array features, but now multiple precision is supported. In fact, ABC now has quite a few new features and a number of bugs that cropped up have been eliminated.

Improvements

The user has the choice of single, double or extended precision arithmetic. This will be most useful in many applications, particularly in scientific calculations. There were a certain number of structural restrictions in ABC 1: principally, multiple exits from loop structures were not allowed. This restriction has been removed in the new version. Another improvement towards full BASIC V compatibility is that now, functions and procedures support RETURN values. The

RETURN feature in BBC BASIC V was a most welcome development from earlier versions and it is good that this is now part of the ABC compiler.

The ABC Library Module

There is one major change in this new version of the ABC; the provision of the ABC run time library as a relocatable module. When a program in any language is compiled, it is necessary to include a library of the code for all the basic facilities of the language. This collection of code must be appended to all compiled programs; clearly this makes for some repetition and swells the minimum size of a program. Providing this library as a relocatable module means that the size of the minimal program has been reduced to approximately 2 kbytes. This module must be installed whenever ABC programs are run.

Conclusion

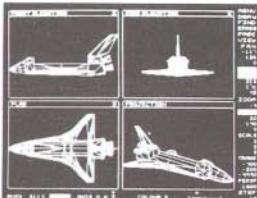
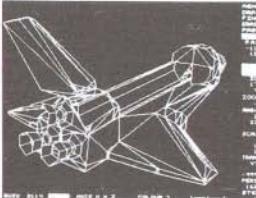
This package is substantially improved. When you consider the Dabs Press policy of free upgrades to all registered owners, this is an attractive package. Dabs will also be producing a BASIC utilities disc for use with ABC. More news on this next month.

(Still no sign of Silicon Vision's compiler being ready for release, but we will let you know how it compares with ABC-2 as soon as we can.) A

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£49.95 (BBC)

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The Super-Dump converter allows you to take advantage of the highest resolution capability of the Archimedes. It takes up to 1024x1024 pixels to produce 1920x1024 resolution images can also be used as hard copy output or sent to a plotter. Fully compatible with SolidCAD. The system is fully compatible with SolidCAD, Array design system & 3D CAD Animation system. SolidCAD designs and arrays from other CAD packages can be made compatible with Super-Dump. The system can also handle Postscript. An example program is included in the Super-Dump.

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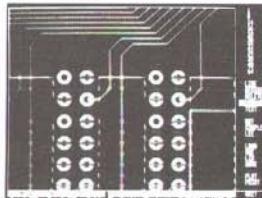
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First Word Plus Hints & Tips

Compiled by Mike Hobart

• Willie Stott has sent in a very complete set of facilities for support of the Epson LQ series, including a download font designer. This will only be of interest to those with the right hardware, but he has used a neat idea to get control of any extra facilities that your printer supports, but for which First Word Plus has no category. He points out that foreign characters can be used as printer definitions. The characters with ASCII values between &E0 and &EE appear on the bottom line of the character window and you have to do three things:

- Define the character as a suitable message to the printer in the character translation table of the hex file, then turn it into a driver.
- Design suitable character definitions (using VDU23,...) to represent the action of the printer so that it is added to the computer's character table when FWP is booted up.
- Include your definitions in the FWP boot file before the *key 1 ... line.

• A tip from an unknown writer (maybe Paul knows who to acknowledge – *Sorry, no. Ed.*): how would you like to be able to produce a spool file of your FWP output? What? Not much! You may be missing something, as you could then move the file to another machine and get a printout via that machine, e.g. via an IBM or a mainframe. The trick is to *SET PrinterType\$4 <spoolfilespec> before booting up FWP. Then select "network port" from the printer box in FWP. The system variable PrinterType\$4 holds the pathname for network printer output. The <spoolfilespec> needs to include the full adfs:\$filename format.

• Someone besides me is the kind of two-fingered typist that hits <ctrl> at the same time as <A>. What should our correspondent do? File his fingers down? Stick a piece of rough Velcro on the <ctrl> key? No, contact the Archive office and have someone write a module to intercept <ctrl-A> and make a beep. The trouble is that when you are just feeling bold enough to try to modify a bit of assembler to help a friend, you should not choose a keyboard buffer intercept. There is no way to try it

out safely, or even to get a decent service from the debugger as every keypress goes via your duff code. You cannot even type "*rmkill" successfully. The only key which really works is <reset>. Help!! All serious programmers out there: where did I go wrong? Why does the IRQ stack pointer unwind so fast? P.S. If you can include a <ctrl-f12>=swapcase facility in the module, you will win a large "thank you" and a small prize for the best solution. You can start with the PrintKey module program in Archive 1.10, page 45.

• There is a new version of FWP available from Acorn for those whose copy does not pause at the ends of each page, even if the flag has been correctly set in the printer driver. Return your disk to Customer Support, Acorn Computers Ltd., Fulbourn Rd., Cherry Hinton, Cambridge CB14JN. (Reprinted from BBC Acorn User, Feb '89, p 10).

It is rumoured that there is a genuinely new version on its way, perhaps to coincide with RISC-OS.

• Johnathan Young has a cure for the FWP buzz (the one which comes out of the speaker or down the external audio output, and sounds like the onset of tinnitus): boot up and then exit EMR's sound synth package. A bit expensive for silence, but you get the music program free! Has anyone an explanation or a better solution? A

Contact Box

• North East User Group for Archimedes? Anyone in the Newcastle area interested in starting up an Archimedes group? If so, please contact Mark Goundry, 6 North Close, Ryton, Tyne & Wear, NE40 3LJ.

• Conference for Academic Users of Archimedes – Brian Cowan is considering the possibility of organising a one day conference for academic users of Archimedes computers. If any Archive readers are interested, would they let Brian know, preferably through the academic computer network, Janet. Brian's computer address is COWAN@UK.AC.RHBNC.PH.V1. Suggestions for topics to be included are most welcome. A

Hardware Corner

Brian Cowan

Most Archimedes owners will be eager to install RISC-OS in their machines; many of my deliberations this month will be in that direction. Before I go any further, we've had a number of enquiries from non-technical readers about doing the RISC-OS up-grade. Let me reassure you; all you have to do is unscrew the lid of the box, remove the four existing Arthur 1.2 chips and insert the new chips. No soldering or link changes are needed.

I²C Bus

As mentioned last month, RISC-OS contains a relocatable module supporting this versatile serial bus. But beware... although the I²C standard specifies drive and loading requirements, the Archimedes hardware falls far short of this. You will recall that the two I²C bus lines are provided by two pins of the Input Output Controller (IOC). This has rather limited drive capability and bidirectional buffering would be difficult. Unbuffered it seems doubtful whether you could drive more than a foot or so of cable, so this is all rather a disappointment. It would appear that the I²C bus is provided primarily for internal use.

All is not lost, however. I think that at least one company will be providing a podule which includes a fully buffered I²C bus. But enterprising hackers might like to do their own. The difficulty is in the software support, not the hardware. Two lines of the I/O board User Port could be used, but software must be written to drive it – presumably the Acorn I²C relocatable module could be suitably hacked!

Speeding Up ROMs

I wrote some time ago (Archive 1.11, page 17) about reprogramming the MEMC chip to speed up ROM access. There was a speed increase of some twenty five percent to be had if your ROMs were up to it. It seems just as well that a disclaimer was included in the article: at least one owner's ROMs suffered a "melt-down"! Running the ROMs continuously at the enhanced rate can overheat them. So be careful.

With RISC-OS, there is an alternative method of achieving this speed increase. Using *RMFASTER

<module-name>, the specified module is copied over into RAM and run from there. The RAM runs at the fast rate always. The only disadvantage is that RAM space is used for the modules, reducing space available for programs/data.

Designing Printed Circuit Boards

I am currently investigating Silicon Vision's ARC-PCB printed circuit board design system and hope to produce a review for next month. But for anyone interested in this area, I can tell you now, it is a very impressive system. It compares very well with some (non-Archimedes) systems which are much more expensive.

Screen brightness problems?

Two of my model 310s do not provide adequate screen brightness, particularly when using Taxan multisync monitors. Originally I thought it was a monitor problem, but a little detective work showed that the problem was with the levels of the analogue colour outputs from the computers. Apparently this is a problem with some models, and your dealer should do (or arrange for) a free mod. You should know what the issue number of your machine is. In next issue I will tell you which numbers require modification.

I will be doing my own upgrade and will let you know how I get on. It should be fairly trivial, just a matter of changing some resistors. If there are no problems then I will give full details of what to do. (*Err, Brian, look back to Archive 1.3, page 8! This just underlines the need for a comprehensive disc-based index. Any offers? Ed.*)

Frequent electrocution!

Also on the monitor theme – I have received a number of shocks from my Taxan multisync monitors when carrying them. They are disconnected at the time so this is a discharge problem and I think it occurs when some screws underneath are touched. The risk to health, I can live with(?), but on one occasion I almost dropped the monitor! Watch out.

Acorn's Unix Box

Acorn's Unix machine (See also the press release

which follows) was launched at the BETT show in January. The machine, called the R140, seems to be a 440 with a 50 Mbyte winchester. It has RISC-OS with its superb desktop and Unix is loaded from the winchester. However, since Unix is rather hungry on memory, there is very little space left on the hard disc for the user. There will be an SCSI podule for external storage devices – winchesters and optical

discs – and an Ethernet podule will provide fast networking.

The price of the R140 is some £3,500 plus VAT. Although outside the budgets of casual Archivists, there may be some spin-off: hopefully the Ethernet and SCSI podules will be usable on our Archimedes range. I will keep you posted. [A]

Unix Workstation at under £4000

Acorn Press Release

The new R140 range from Acorn Computers offers a powerful Unix workstation with integrated multi-tasking, multi-user, graphics, windowing and networking capabilities for less than £4000 – similar to the cost of a bare-bones PC and below the price of any comparable product. Based on Acorn's award winning 4 MIPS, 32-bit RISC processor, the R140 provides low cost desktop Unix while maintaining full connectivity with other standard workstations, PCs and multi-user systems. Included in the price is a complete 12-month support package with on-site maintenance, telephone hotline assistance and diagnostics from Granada Microcare, the nationwide third-party maintenance organisation, plus warranty and free software updates as released.

Acorn believes that the R140 offers the right features at a price that will capture a significant slice of the growing Unix market. Recent projections published by market researchers, Wharton Information Systems, predict the number of installed Unix systems to rise from 50,000 in 1988 to 230,000 by 1992. With firm international standards emerging, Acorn will also be offering X/Open and Posix compatibility by the end of this year.

Available now through Hugh Symons Distribution Services in Poole, Dorset, the R140 workstation comprises 4 Mbyte of RAM, an internal 60 Mbyte (unformatted) hard disc, a 3.5" 1 Mbyte (unformatted) internal floppy disc and four expansion slots. One of these slots accommodates the Ethernet and 'thin' Ethernet ports.

The Acorn RISC iX operating system is a comprehensive implementation of Berkley 4.3 Unix with System V extensions. X Windows (Version 11, release 2) provides powerful graphics

facilities and windowing including terminal emulation, while the X.desktop user interface from IXI offers easy-to-learn Unix with its highly visual WIMP environment. Applications may be started and files manipulated by mouse clicks rather than traditional complex Unix typed commands.

A wide range of monitors is supported, with resolutions up to 1152 x 900 in monochrome – as found on Sun workstations – and 640 x 480 in colour, equivalent to the VGA mode of PCs. Acorn is offering the R140 workstation packaged with standard monochrome monitor for only £3,999 (ex VAT).

NFS, Yellow Pages, TCP/IP networking and X11 client/server software, provided as standard, facilitate easy integration into network environments via Ethernet. In particular, the R140 workstation offers an affordable solution to extend existing Unix systems. Simple connection can be made to PCs, workstations and mainframe computers from Sun, Appolo, IBM, DEC, ICL, Olivetti, AT&T and other manufacturers, without disruption to the network. For stand alone operation, the R140 is offered without the Ethernet interface card for £3,500 (ex VAT) and for Econet networking, an interface module can be fitted. Serial and parallel ports are provided as standard.

Future expansion options from Acorn will include a SCSI card for external hard discs, tape drives, scanners and laser printers; and a floating point co-processor. Third party expansion cards available include a multiple serial port, IEEE 488 interface, video digitiser, fax and modem cards and A/D converters and samplers.

Alternative operating systems, MS-DOS and Acorn's RISC-OS give access to vast libraries of business, engineering and educational software.

Files may also be read from, written to and formatted within the RISC iX environment.

"We believe that the R140 range will satisfy the growing demand for affordable Unix from computer users in commerce, industry, science, administration and education," said David Slight, Acorn's Unix product manager. "The R140 workstation provides not only powerful and versatile computing, but also reliable and prompt support and the long term commitment from the only UK computer manufacturer in full control over the development of its own advanced RISC technology," he added.

R140 Unix Workstation Specifications

Systems unit:

- ARM(Acorn RISC Machine) 32-bit RISC processor
- 4 Mbytes RAM, 512 Kbytes ROM
- 60 Mbytes (unformatted) internal hard disc
- 1 Mbyte (unformatted) internal 3.5" floppy disc drive
- Four expansion slots

Keyboard and mouse:

- 103 Key 'enhanced PC' style keyboard
- 3-button mouse

Standard interfaces:

- Serial interface
- Parallel interface port

Display monitor support:

- Ultra-high resolution monochrome
- 1152 x 900 pixel graphics
- 144 x 45 or 96 x 32 characters
- High resolution colour, gray-scale or monochrome
- 640 x 480 x 4 bits per pixel giving 16 from a palette of 4096 possible colours
- Text applications: 80 x 20, 80 x 24 and 80 x 30 characters

Hardware expansion options:

- Ethernet:** Combined expansion card with both Ethernet and 'thin' Ethernet/Cheapernet, compatible with IEEE 802.3

- External storage:** SCSI expansion card for external hard discs, tape drives, scanners

and laser printers. Support for a second external winchester using the internal ST506 disc controller.

Floating point co-processor: Expansion card with WE 32206 co-processor (IEEE 753 compatible)

Econet: Internal Econet expansion module (which does not use up an expansion slot)

Standard Software

RISC iX operating system:

Berkeley standard distribution 4.3 two-use license

Demand paged virtual memory
C shell and Bourne shell

Berkeley toolkit
TCP/IP with Berkeley networking commands
uucp, telnet, ftp micro-Emacs, Kermit
SVID kernel extensions (KE_OS)
Full ANSI C compiler
Pcc compatibility mode for non-ANSI code
NFS 3.2, Yellow Pages

Programmers and Documenters' tools
Special features for:

- * efficient use of memory including file compression for disc storage
- * end-user administration
- * virtual terminal interface giving multiple VT220 terminal emulation

Window System:

X Window System version 11 release 2
awm, twm, and uwm window managers
X.desktop from IXI limited

MS-DOS Operating System:

via RISC-OS PC Emulator software

RISC OS Operating System:

including Application Suite and manuals

Documentation Included:

- R140 Operations Guide
- RISC iX Users Guide
- RISC iX X.desktop Guide

Optional Documentation:

- RISC iX Programmer's reference manual
- RISC iX Administrator's manual A

Languages – More about Pascal

David Wild

I am very grateful to a reader for pointing out an error in the example function that I gave when I wrote about modules. This version of Pascal, as with any version which observes the standard, will not accept "anonymous" types in a routine definition – except when conformant array parameters are being used. This is, incidentally, what led me in to the trap, because I started to use a conformant array parameter, realised that it didn't give quite the effect I wanted but forgot to go back to the beginning and look at what I had done.

As a penance I have written out 100 times "I must test every piece of code that I put in the magazine – even if I don't expect anyone to use it". Still, it does give me the opportunity of saying a bit more about modules and the way they are used in programs.

Variable Types

Firstly, I must deal with the question of types. If you are using the standard types (integer, real, boolean and char) there is, of course, no problem. There is also no problem with conformant array parameters which are always, in a sense, anonymous. In both of these cases, the only test is whether the declaration is correct for a function or procedure. The fact that it is going to be declared in two separate places is irrelevant.

If, however, you need a type which is not standard, you must declare the type in both the module and the program. This means that details of any type declarations will need to be included in the documentation that you supply. You may wish to supply both the type declaration and routine definition as an "include" file, taking advantage of the relaxation of program order in the Acorn extensions. As the use of modules is, in itself, non-standard there is no need to be worried about introducing another, associated, non-standard feature.

Export variables

In the previous article, I explained the use of 'export' functions and procedures but didn't really cover the idea of export variables. These are variables given a value inside a module but accessed by the calling program.

The values can be inserted as declarations when the program is written and this might well apply to constants such as 'pi' and 'e' in mathematical programs, where you want to ensure that the right value – with the appropriate number of decimal places – is used.

Retaining values between calls

A much more interesting use is possible because a module can retain the values in export and static variables between calls. This means that you can, if it is appropriate, calculate values on a first call of the module and then access them from the variables without further function or procedure calls later in the program.

This could apply, for instance, to a table of minimum taxable pay based on the tax week number. The table would be calculated once, on the first call, and by using the tax code as a subscript, you would find the value for each employee without any further calculation. Only if the gross pay to date was greater than the value in the table would it be necessary to call the function to calculate the tax payable. Obviously, this is a contrived example and it would only be useful if the majority of the employees were low paid and thus unlikely to be liable for tax.

The example does illustrate the way in which separate modules can be used to good advantage. When I started as a programmer, my first job was to do with programming the payroll. While we wrote the programs which dealt with the way in which people were paid, the routines for tax and national insurance were supplied as subroutines by the computer manufacturer. These subroutines had been agreed with the relevant government departments and so we did not need to worry about the correctness of this part of the program.

A similar effect could be achieved with modules and Pascal programs. A new module would be supplied whenever the tax rules changed and all the user would need to do would be to link it to the main program. As this does not take very long and will not change those parts of the program not calling the module, much of the risk is taken out.

The craft of programming

The separation of tasks into modules can also give a boost to the craftsman programmer who may not have a bright idea for a program but who does know good ways of solving particular problems. I feel that the craft of programming is often underrated, especially when an especially good computer game is attributed to a "brilliant programmer". While it may be true that the person concerned is a very good programmer it is the idea for the game which has done the trick. I have seen beautifully crafted programs which were not worth playing, because they were boring and good ideas which were let down because the programming was not good enough. Another manifestation of the same problem, especially in the early days of home computing, was the program which did some small piece of mathematics. The trouble was that after you had tried it out once or twice you didn't want to bother with it again.

You can now write a module to do this small piece of work, whether mathematics or not, and let other programmers use it in developing their idea for a program to meet a specific requirement. I have written a module to validate International Standard Book Numbers. No-one would want a program that did just that, but it could be just what is needed by someone who is writing a book-ordering or cataloguing program. One other advantage of the module concept is that it has been tested as it stands and its correctness will not be affected by its incorporation into another program. It also has the advantage that details of the code are still my secret even when they are incorporated in your program.

Smith and Wiggins have already published one collection of modules and I hope that there will soon be several more collections which will enable us to assemble 'bespoke' programs by putting the modules together with some suitable linking code.

Further clarification needed

The same reader drew my attention to a sentence which seems much more obscure in the printed form than it did when I typed it! This is "By making sure that these routines can only be called in the right way, you may be able to eliminate the use of some checking routines – such as 'divide by zero'". One of my beliefs is that program users, as opposed

to programmers, should never get a message from the computer because of a mistake they make in entering data. Routines which could 'crash' if invalid data were to be sent to them should be protected by initial tests on their parameters and it may be appropriate to add a 'result-code' parameter to send back a reply showing that the required function, such as the square root of a negative number, could not be calculated.

If, instead, all calls to subsidiary functions are made through the 'export' routine this can do the checking and call the others only if the conditions are right. In this case, none of the subsidiary routines need their own protection.

Pascal !boot file

A reader in South Africa sent a useful !boot file, with comments, for pascal programming. (The numbers at the beginning of each line are only to connect with the notes below.)

```

1 *|>:Pascal1.$.!boot
2 *GOS
3 Set Alias$LinkPas
  :Pascal2.Library.link aof.%0 -
library :Pascal2.$.paslib -image
$.%0
4 Set Alias$Compile Remove lis.%0
<10> Pascal %0 -list %0 -store -
extend
5 Set Alias$Transfer Copy $.%0
  :Pascal2.$.obj.%0 q~c~vd
6 Set Run$Path .%,:Pascal2.Library
7 Set Alias$@LoadType_FFF Twin %0
8 Set Alias$@RunType_FFF Twin %0
9 FPE

```

Notes

- 1 – Full Path name
- 2 – Enter Supervisor
- 3 – Link files
- 4 – Remove any existing list file and compile
- 5 – Copy executable files to another disc
- 6 – Extend the Run Path to include the Library on
 :Pascal2
- 7&8 – Set the Load & Run options for these files
 to enter Twin and then load the files
- 9 – RMload the floating point emulator

These instructions seem very useful and you can adapt the directory names to suit your own directory structure. A

BASIC V Forum

Clifford Hoggarth

Positioning Text

One letter received recently commented on a difference of behaviour between differing versions of BBC BASIC regarding the use of PRINT TAB(x,y) when used with VDU 5. The first important fact here is that VDU sequences are part of the operating system and hence the differences seen are due to changes in the version of the operating system used, not the version of BASIC. Indeed when tested (using the 6502 emulator where necessary) BASIC versions I, II, IV and V all behave the same under Arthur 1.2., but under OS 1.2 on the BBC Micro BASICs I, II and IV behave the same but differently to under Arthur.

So what is the difference?...well first a look at the effects of VDU 5 and VDU 4.

Cursors

The BBC Micro operating systems in general and the Archimedes OS in particular, use two different cursors for screen output: the text cursor and the graphics cursor. The text cursor points to a character cell, the origin (0,0) being the top left character of the screen and the bottom right being (number of columns -1, number of rows -1). Text is normally printed at this cursor and it can be positioned using TAB(column,row).

The graphics cursor is used for plotting commands such as DRAW, CIRCLE etc. and can be positioned (using MOVE x,y) anywhere on a 1280 x 1024 logical pixel grid. The OS then scales this according to the physical pixel resolution of the mode being used. (Note: under RISC OS some modes do not display the full 1280 x 1024 logical map area and hence some values will be "offscreen".)

It is possible to "join" the text cursor to the graphics cursor using the sequence VDU 5 and they can be "split" using VDU 4. When the cursors are joined, text can be printed at any pixel on the screen, the top left pixel of the first character (8 x 8 matrix, BBC Font) is positioned at the pixel corresponding to the graphics cursor. The graphics cursor is left at the top left of the next character to be printed, allowing for any carriage returns, etc. This allows text to be

positioned anywhere on the screen rather than being limited to the cells of a "text" screen.

Under Arthur 1.2, TAB(x,y) can be used even when the cursors have been linked with VDU 5 and text appears in the correct position. However under some versions of the BBC Micro OS, TAB(x,y) did not position the text correctly.

Now the question raised was what is the reason for the two modes, i.e. "joined" and "separated" if TAB(x,y) works in "joined" mode. The answer is "several". Firstly, the results are often not what was expected especially if a graphics window is in operation. Secondly no scrolling occurs following VDU 5 – try listing a long program following VDU 5. More importantly, and this can be seen with the same program listing demonstration, the characters are printed differently. When printing in VDU 4 mode the whole character cell is drawn, so a foreground colour character appears in a 8 x 8 block of background colour. However following VDU 5, only the character is drawn and the background remains the same.

This shows further advantages as overprinting can be performed. Note that in VDU 5 mode, printing is a graphics operation and thus the colour must be selected using GCOL. The GCOL plotting types may also be used. The demonstration program shows these differences.

The overall recommendation is **not** to use TAB(x,y) with VDU 5, as it has no advantage (other than perhaps not having to calculate graphics coordinates from text co-ordinates) but several potential disadvantages. The TAB function is designed to be used in VDU 4 mode (it probably uses the OS VDU 31 sequence "position text cursor").

Controlling the pointer without the mouse

A routine sent in by Brian Carroll set me thinking on this one. In Brian's procedure the pointer is unlinked from the mouse by adding 128 to the pointer number using

```
MOUSE ON pointer_number+128
```

and so is not affected by moving the mouse (see OS_Byt &6A, PRM page 128). The pointer is

positioned using the MOUSE TO command and so needs to be temporarily linked to the mouse to enable the positioning. Moving the mouse at this time affects the positioning of the pointer.

However there is a way round this problem, using another variant of the mouse command, MOUSE STEP <factor>,[<factor>]. The factor values are used to scale the mouse speed, the mouse movement being multiplied by these factors, thus high values produce rapid pointer movement and the value 1 the slowest. (N.B. only integer values are used so a value 0<factor<1 is INT'ed to 0. A factor of zero produces no movement (as something times nothing is nothing!). Hence if a factor of zero is used, moving the mouse does not affect the pointer, but the MOUSE TO x,y command works as normal. So at the start of the program issue:

MOUSE STEP 0

and thereafter position the pointer with:

MOUSE TO x,y

where x and y are graphics coordinates of the "active point" of the pointer.

Another possible use for MOUSE STEP is to reverse the direction by using negative factors. For example those of you who have tried using the mouse tracker-ball style will have realised that by turning the mouse over you reverse one of the directions, well this can be overcome using e.g.:

MOUSE STEP -1,1

Controlling the pointer in this way allows the pointer to be treated in a similar manner to a sprite, albeit of limited size and only three colours, but remember the pointer is a hardware sprite and hence the programmer does not need to worry about drawing it or redrawing what it previously covered as it is superimposed on the screen by the vdu hardware.

Up to four pointers can be defined and the relevant one can be selected by:

MOUSE ON pointer_number

To temporarily unlink the mouse use the command

MOUSE ON pointer_number+128

and to relink it

MOUSE ON pointer_number

as normal.

Well that's all for this month. Next time I'll be taking a look at errors in BASIC. How to trap them and how to generate your own.

Listing 1 : VDU 4 & 5 demonstration

```

10 REM > &.Vdu4and5
20
30 MODE 9
40 COLOUR 9,96,96,96
50 COLOUR 137
60 CLS
70
80 COLOUR 128 :REM Black b'ground
90
100 VDU 4
110 FOR c=0 TO 7
120 COLOUR c
130 PRINT TAB(c,c) "Printing with
                           split cursors"
140 NEXT
150
160 VDU 5
170 FOR c=0 TO 7
180 GCOL 0,c :REM Try altering
                           first parameter
190 MOVE c*32,64+c*16
200 PRINT "Printing with joined
                           cursors"
210 NEXT
220 VDU 4
230 END

```

Listing 2 : Brian Carroll's routine

```

DEF PROCpointer(x%,y%,ptr%)
: REM parameters are x-coord,
   y-coord and pointer number
: REM ptr%=0 is off, 1 is arrow
   and 2,3,4 are defined shapes
MOUSE ON ptr% :REM link pointer to
   mouse
MOUSE TO x%,y% :REM position the
   pointer
WAIT :REM wait for vertical sync;
   ESSENTIAL
MOUSE ON ptr%+128 :REM unlink
   pointer from mouse
ENDPROC

```

(Note the WAIT command is necessary for the pointer to appear. I think this has something to do with updating of the VIDC usually only occurring during the flyback phase as the electron beam returns to the top of the screen.) **A**

Assembly Language Programming – 8

Alan Glover

This month we cover the last two groups of the assembly language and start using all the instructions in some examples.

Group 4 – Branch (with optional link)

This instruction is used to transfer execution to another address in memory. The syntax is:

B (L) <offset to address>

The offset is added to the value of the program counter to derive the new value. The offset can range throughout the addressing range of the ARM. The calculation of the offset, which is complicated by pipelining, is handled automatically by the assembler.

The optional L parameter causes a 'Branch with Link'. In this instance R14 is set to the address after the BL instruction. So the called routine can return to the place it was called from with a MOV R15,R14 or a LDM instruction. Care must be taken not to nest BL calls without saving R14.

Calls to Arthur routines do not corrupt R14 since Arthur has other copies of R14 (and some other registers) to use. This applies chiefly to the SWI instruction, discussed next.

E.g. BL loop (commence execution at location called 'loop', with R14 set to the address of the instruction after the BL for when it returns)

Group 5 – SWI – Software Interrupt

SWI (<condition>) <expression>

This instruction is used to call an Operating System routine. From a users' point of view, it is like a BL in that execution continues (unless something drastic happens) from the instruction afterwards, but R14 will not be corrupted. The SWI instruction has a 24 bit field in which to encode data. Consequently there are 2^{24} possible SWI calls.

The assembler allows you to refer to SWI calls by their name, e.g.

SWI "OS_WriteC" (evaluated as SWI number 0)

The case of the letters must be correct for the name to be recognised. The SWI calls provided by Arthur are documented in the Programmers Ref. Manual.

That's covered almost all of the ARM instruction set. There are some more instructions for use with co-processors, but I am not going to cover them here. More details can be found in Appendix A of ARM Assembly Language Programming by Peter Cockerell – but note that corrections to some of the information in that appendix were published in Archive 1.7, page 32.

We finish with an example program that draws together instructions of all groups.

```
10 REM >MemTest2
20 REM A.Glover, January 1989
30 REM
40 REM This program explores the
      current memory map of an A series
50 REM machine to find the current
      store sizes.
60 REM
70 REM More on SWIs used in the PRM.
80 REM
90 WriteI=&100
100 DIM Code 1024
110 FOR A%=0 TO 3 STEP 3
120 P%=Code
130 [OPT A%
140 STMFD R13!, {R0-R5,R14} \Save R0-
      R5 and R14 (my return address)
150 SWI "OS_Writes" \Write following
      text to VDU (until 0 found)
160 EQUS "Actual memory allocation
      within system"
170 EQUW &0DOA
180 EQUB 10
190 EQUS "System Workspace
      ..... 00000000 - 00007FFF =
      32K"
200 EQUW &0DOA
210 EQUS "Application Workspace
      ..... 00008000 - "
220 EQUB 0
230 ALIGN \Back to multiple of 4 for
      next instruction
240 \R0-R2 - General uses
250 \R3 Used to accumulate total
      memory found in system (in K)
260 \R4 General use
270
```

```

280 MOV R3,#32 \Start with 32K of      680 EQUS "Screen Memory
      System Workspace               ..... "
290 MOV R0,#&8000 \Applic'n workspace   690 EQUB 0
      begins at &00008000           700 ALIGN
300 BL TestMemory \Finds end of space   710
      and displays it            720 \A different technique is used
310                                         for the screen memory ...
320 SWI "OS_WriteS" \Put out next line 730 \"OS_ReadVduVariables" is used to
      of screen display          get the size from the VDU drivers
330 EQUS "RAM disc space              740
      ..... 01000000 - "
340 EQUB 0                           750 ADR R0,Indata \R0 points to
350 ALIGN                            parameter list for the call
360 MOV R0,#&01000000 \Start of       760 ADR R1,Outdata \R1 points to
      configured space for RAM disc 770 SWI "OS_ReadVduVariables"
370 BL TestMemory                   780 ADR R0,Outdata \R0 points to the
380                                         space the result was put
390 SWI "OS_WriteS"                 790 LDR R0,[R0] \And load R0 with the
400 EQUS "Sprite Area"             800 MOV R4,R0,LSR #10 \R4=number of K
      ..... 01400000 - "
410 EQUB 0                           800 of screen memory (R0 / 2^10)
420 ALIGN                            810 ADD R3,R3,R4 \Update total memory
430 MOV R0,#&01400000 \Start of       in system
      configured Sprite space       820 RSB R0,R0,&2000000 \Screen start
440 BL TestMemory                  820 = &2000000 - screen length
450                                         830 ADR R1,buffer
460 SWI "OS_WriteS"                 840 MOV R2,#10
470 EQUS "Relocatable Module area  850 SWI "OS_ConvertHex8"
      ..... 01800000 - "
480 EQUB 0                           860 SWI "OS_Write0" \ Convert R0
490 ALIGN                            value to ASCII and display it
500 MOV R0,#&01800000 \Start of       870 SWI WriteI+&20
      configured RMA space         880 SWI WriteI+ASC"--"
510 BL TestMemory                  890 SWI WriteI+&20 \ Display " - "
520                                         900
530 SWI "OS_WriteS"                 910 MVN R0,#&FE000000\I want &1FFFFFF
540 EQUS "System heap/Supervisor   910 which cannot be loaded directly,
      stack 01C00000 - "           920 \ so instead I use MVN, which
550 EQUB 0                           920 inverts the number
560 ALIGN                            930 \ before loading the register.
570 MOV R0,#&01C00000 \Start of System 940 ADR R1,buffer \ Convert R0 value
      space                         940 to ASCII and display it
580 BL TestMemory                  950 MOV R2,#10
590                                         960 SWI "OS_ConvertHex8"
600 SWI "OS_WriteS"                 970 SWI "OS_Write0"
610 EQUS "Miscellaneous workspace  980 SWI WriteI+&20
      ..... 01F00000 - "
620 EQUB 0                           990 SWI WriteI+ASC"="
630 ALIGN                            1000 SWI WriteI+&20 \ Display " = "
640 MOV R0,#&01F00000 \Start of misc 1010 MOV R0,R4 \ Convert R4 (number
      space                         1010 of K) to decimal and display it
650 BL TestMemory                  1020 ADR R1,buffer
660                                         1030 MOV R2,#10
670 SWI "OS_WriteS"                 1040 SWI "OS_ConvertCardinal4"
                                         1050 SWI "OS_Write0"
                                         1060 ADR R0,some_memory

```

Assembly Language Programming

```
1070 SWI "OS_Write0"
1080 SWI "OS_Writes" \ Next bit of
                           screen display
1090 EQUB 10
1100 EQU "Total memory in system : "
1110 EQUB 0
1120 ALIGN
1130 ADR R1,buffer \ Convert R3
   (total memory found) to decimal
1140 MOV R0,R3 \ and display it.
1150 MOV R2,#10
1160 SWI "OS_ConvertCardinal4"
1170 SWI "OS_Write0"
1180 ADR R0,some_memory
1190 SWI "OS_Write0"
1200 LDMFD R13!,{R0-R5,R15} \Restore
   R0-R5 and R15 to R14 given on entry
1210
1220 .Indata \Parameter block
   specifying VDU variable 150
1230 EQUD 150
1240 EQUD -1
1250
1260 .Outdata \Block for value of VDU
   variable 150 to be returned
1270 EQUD 0
1280
1290 .TestMemory
1300 \On entry R0 is start address to
   test from
1310 MOV R5,R0\Save R0 for later in R5
1320 MOV R4,#0 \ Total memory found
   so far
1330 \First test for no space at all
1340 ADD R1,R0,#2000 \ 8k - smallest
   configurable block of memory
1350 SWI "OS_ValidateAddress"
1360 \Returns CC if OK, i.e. the
   address is mapped to some RAM
1370
1380 ADRCS R1,buffer \This section
   only executes if the address
1390 MOVCS R2,#10 \was invalid
   immediately, i.e. there is no
1400 SWICS "OS_ConvertHex8" \memory
   assigned to this store eg RamDisc!
1410 SWICS "OS_Write0"
1420 ADRCS R0,no_memory
1430 SWICS "OS_Write0"
1440 MOVCS R15,R14 \return to caller
1450
1460 ADD R3,R3,#8
1470 ADD R4,R4,#8 \ 8K of memory
   found so far
1480 .loop
1490 ADD R1,R1,#2000 \Add 8K to
   memory being checked
1500 SWI "OS_ValidateAddress"
1510 ADDCC R3,R3,#8
1520 ADDCC R4,R4,#8 \Update R3 and R4
   if that 8k was found and go to loop
1530 BCC loop
1540 SUB R0,R1,#2000 \Test failed,
   so end of memory is R1-&2001
1550 SUB R0,R0,#1 \&2001 cannot be
   represented as one immediate value
1560 ADR R1,buffer \Convert R0 to
   ASCII and display it
1570 MOV R2,#10
1580 SWI "OS_ConvertHex8"
1590 SWI "OS_Write0"
1600 SWI "OS_Writes" \Write "=" on VDU
1610 EQU " = "
1620 EQUB 0
1630 ALIGN
1640 MOV R0,R4 \Display number of K
   found in this section
1650 ADR R1,buffer
1660 MOV R2,#10
1670 SWI "OS_ConvertCardinal4"
1680 SWI "OS_Write0"
1690 ADR R0,some_memory
1700 SWI "OS_Write0"
1710 MOV R15,R14 \Return to caller
1720 .buffer EQU STRING$(10,CHR$0)
1730 ALIGN
1740 .no_memory
1750 EQU " = 0"
1760 ALIGN
1770 .some_memory EQU "K"
1780 EQUW &0D0A
1790 EQUB 0
1800 ]
1810 NEXT
1820 CLS
1830 CALL Code
As well as using a number of new SWI calls, the
program also uses a few tricks to emphasize the
versatility of the ARM code; for example the use of
RSB in line 820 and MVN in line 910.
The usefulness of Arthur is indicated by the use of
calls like ConvertHex and ConvertCardinal, which
provide easy conversion between different bases
and ASCII.
And now it's up to you ! A
```

WIMP Template Editor Review

Alan Glover

There is quite a history to this program. The original concept and program were produced by Acorn but never sold to the public. Since then, this version has been produced by Adrian Look and Acorn themselves have also overhauled the program in preparation for RISC-OS.

The purpose of the program is to simplify the designing of windows, icons and menus for use in the Wimp environment. Anyone who has experimented with this aspect of the Archimedes will know that a lot of effort is required just to get one window to appear on the screen, let alone get all its attributes set correctly!

This program helps simplify things by allowing you to select what you want to see, with an image on screen being updated as you work. The screen itself uses the new colour scheme chosen for the RISC-OS desktop – consisting of various shades of grey rather than the garish colours in the present desktop.

The program is quite intuitive to use, with the primary choices being available from an icon bar or from a pop-up menu. Having it both ways gives you the potential of turning off the program's icon bar to design your own.

Once all the window and menu definitions have been completed the information can be saved to a template file.

To use the templates, the definitions must be reloaded into memory by the application program, which then calls SWI Wimp_CreateWindow with a pointer to the template data instead of the usual massive data block. Some basic procedures are included to illustrate this (in fact it is an extract from a recent article in Archive!).

Also provided is a module which allows menu templates to be loaded in the same manner.

However this is a very specialised tool. It is only of assistance in laying down what windows, icons and menus will look like. The user must still write the entire handling program – a point which the documentation itself makes (in bold type!). This results in very cursory treatment of the handling of

the templates once they have been generated. One article from Archive has been reprinted to explain about the WIMP's Template facilities and the user is referred to past articles for all other information.

In fact, the documentation provided on paper is minimal – a single sheet of A4 paper folded to 5 (equivalent to four pages in this magazine). Fortunately there is a help facility in the program, which, like that in Artisan, explains what can be done depending which buttons are pressed and where the mouse is (e.g. whether it is inside a window) – though without Artisan's amusing messages that are given when you do things like putting the pointer in the help window!

Whether this program is worth buying, depends a lot on how you use the Wimp system. If you already use it a fair deal and would like to simplify the process of defining windows, menus and icons, it is ideal. If you are still experimenting this is still a useful tool – but by no means a solution to the many problems thrown up when first starting to use the Wimp environment.

Whilst not wishing to deter experienced users from buying this program and benefiting from it, I do feel that with more effort in the documentation and a few simple BASIC programs on disc this could easily have turned into the kingpin of a suite of programs which would make using the Window Manager as simple as inserting your own code at appropriate points in the program. It also seems miserly to me that on a disc which is only about half full the user is expected to type in the BASIC procedures from listings in the instruction leaflet.

The Template editor costs £8 from Norwich Computer Services. Copies of Archive issues 1.2, 1.3, 1.5, 1.6, 1.11, 1.12, 2.1 and 2.2 will also be useful for background information. **A**

(We've had similar comments about the lack of documentation and sample programs on disc from other users and so we have added them to the program disc. Any existing user who wants the updated disc, should just send the old one back and we will replace it free-of-charge. Ed.)

Logistix Charts and Macros

Tim Powys-Lybbe

The previous article had put the data in place to compare yields on Gilt-Edged stock. This data can now be used to create a chart to display the data better. Further, the Logistix file can be set so that it immediately displays the chart when you load it in.

The only way I have found to display this sort of data effectively on Logistix is to use a horizontal bar chart as this allows relatively long bar descriptions on the left of each bar. It quickly communicates the main output of the spreadsheet: the different redemption yields available. Obviously, different data on different topics could require a different type of display to show it to best advantage. The strength of Logistix is the wealth of different displays possible.

Make the bare bar chart

To set up a Logistix chart you have to enter lots of different commands in different cells. Table 1 lists the entries that have to be made for each of the cells concerned. To get to each cell in turn, you can: Either: Use the = command, as in =A31 to go to cell A31. Or: Move to the cell with the cursor keys.

In the entries that follow, I have changed the convention from my first article. I have left out the comma between the keys that you have to press; the reason for this is that the first character of chart entries is a comma. (Think ahead, P-L!)

So where the first entry is:

,BHC

this means you press the four keys <comma>, B, H and C in succession. All such entries must be followed by <return>.

Table 1: Make the chart

Cell	ID Entry
A31	,BHC
B31	50
A32	,BAR
C6	H8
A33	,LBA
C32	i12
C32	/ROC32,d32.o32

C33 a12
C33 /ROC33,d33.o33
C30 , STA
O30 , END

(Discerning readers will realise that it does not matter which cell you are at to enter the two slash commands in Table 1.)

Then press the red f4 function key. If all your entries are OK, this will display the bar chart. If the bar chart does not appear properly, then check all your entries, including the data entered previously. Press any key and then <esc> to exit from the bar chart.

Note that you can amend any of your original data and the bars will change accordingly. This is because cells C32 to O32 and C33 to O33 contain cell references to that data.

Add information to the bar chart

The bar chart you have just made has neither title nor any other information to tell you what it represents. Table 2 gives the entries to make on the sheet to add information to the bar chart.

Table 2: Add information to the chart

Cell	ID Entry
A35	,TIA JC C5 S9 T2
B35	Gilt Edged
C35	50
D35	90
A36	,ACY C3 JR S4 IN
A37	,NAX JR C4 S3 C7
B37	Redemption Yields
C37	87
D37	7
A38	,ANN JR S3 C7
B38	Marginal Tax Rate:
C38	83
D38	4
A39	,ANN JR S3 C7
B39	C4
C39	87
D39	4

Again, press the f4 key after this to display the chart with the added information. (It should look like the Figure 2 in the original article.)

Make a macro to show the chart

This macro, together with one name definition, causes the chart to appear when the sheet is loaded. A macro is virtually nothing other than a series of commands that you could have entered yourself at the keyboard; instead you choose to store them in part of your spread sheet and then tell Logistix, somehow, to execute this list of commands. The easy way of telling Logistix to execute the macro is to define the name Start as the top cell of the column containing the macro. In this case, as recommended by Logistix, the macro is put in column AAA so Start is defined as the cell AAA1:

```
/NAStart<return>AAA1<return>
```

Then these entries should be put into column AAA:

<u>Cell</u>	<u>ID Entry</u>
AAA1	"/VS
AAA2	">KEY>ESC>ESC>HOM

This may be tested (without saving and then re-loading the sheet) by defining function key f5 (you can use any of f5 to f8 for this purpose of starting off a macro):

```
/AE<f5>Test<return>>RUNStart<return>
```

Some explanation is needed of the '>' symbols in the above line:

1. In <f5> and <return> it means that the f5 and return keys are to be pressed.
2. The '>' symbol before the letters 'RUN' means that you put the > character on the screen. (It is obtained with <shift-fullstop>.)

Then press <f5> and see the bar chart. You should then press any key and the display will go to the HOME position with cell A1 in the top left hand corner. The use of the name Start means that this macro will be executed when the sheet is loaded. In a way this is similar to a !BOOT file on a disc.

Do some experimenting

The above shows you how to make a chart and write a short macro. I have included little explanation of the entries or commands as this tends to confuse. But you will learn something by amending these entries and seeing the results. If it then enables you to understand the manual (and see your way round the occasional catastrophic misprint – pages 6-11 and 6-27 caused me some considerable delays...) then you may be able to get the best out of this very resourceful spreadsheet and display package. A

Startrader & WordUpWordDown

Philip Green, Rotterdam + Tone Otway

Philip Green starts... Having purchased and much enjoyed their Desktop Games some months ago; I ordered Gem Electronics' new offerings as soon as I read about them in the November 1988 Archive.

A month later, the parcel arrived. Apparently the box manufacturer had let them down badly and they had been forced to make "alternative arrangements". The alternative arrangements were clearly adequate as far as the box is concerned. Having mail-ordered plenty of software from the UK, I am pleased when one arrives in a box that has withstood the rigours of the international postal services!

The same can not be said of the quality of the instruction booklets. They proudly boast "Typesetting and Design by Armored Productions, Birmingham" and the postmark suggests they were mailed straight from there. The booklets are hastily

stapled together sheets of clumsily photocopied text (fold lines on front and back of the paper do not coincide, edges are not trimmed straight). The content is clear enough though and then the fun begins.

Both programs are very well produced. The graphics and sound are marvellous but not overdone. There is no theme tune but the sound effects are, to my mind, well done. The plot of Startrader is extremely well thought out and has you plying your way from planet to planet and from one star system to the next, trading various goods in order to make enough money to continue. But I will let Tone Otway tell you more about that.

Word Up Word Down

Word Up Word Down is a very pleasant word game bearing a certain similarity to another well-known board word game, the main difference being that

there are no double or triple letter/word scores. This does not limit the interest of the game because you can increase your score by piling the letter tiles on top of each other as long as a pattern of correct words is maintained. (This is checked with the program's own dictionary.) You have to be careful not to make the piles too high – if you do, they will collapse and you face a possible points penalty.

After loading the program you are invited to enter the names of the players. There can be anything from two to six players and any number of those can be played by the computer. You also set the level of play, easy, medium or hard for the computer player(s) and pick one of six portraits (3 male, 3 female) to represent each player. You then decide the computer's response to any attempt to exceed the permitted height of piling up letter tiles. The computer can ignore, refuse or penalize this. Then a time limit can be set varying from 2 seconds to 6 minutes or 'OFF'.

The height to which letter tiles may be piled up is indicated by the colours of the squares on the board and varies from two to eight layers. This is a great change with respect to another famous word game where letters that have been placed can not be altered. In this way I put down the word "quavers". This was changed by my opponent to "quivers" by placing the "I" on top of the "A". In similar fashion the word was changed back and forth until there was a pile of four "A"-s and four "I"-s. Each time the player to make the last change was awarded points for a new word.

Clicking on one of the icons gives a perspective view of the board so you can see the height of the piles. Unfortunately you can't tell after the first tile how high you may pile up on that square and this can lead to some heavy penalties.

The computer pronounces each letter as it is placed on the board thus spelling out the word. Words that do not figure in the 33,000+ word vocabulary held in the computer's memory are queried and the player can decide whether to tell the computer to accept them as 'legal' words.

The first player to use each square gets a bonus of 5 points and if anyone uses all seven letters on his or her rack in one go, there is a bonus of 50 points.

Otherwise, the points on each letter tile are given plus the points on all tiles below. This can become quite complicated when the tiles are six or seven deep but the computer keeps perfect track.

You can change your tiles for others instead of placing any on the board or just indicate "can't go" to let the next player try when you are stumped.

Just as with Startrader you can save an unfinished game for completion at a later date. Don't try to save to a write protected disk though as my version crashed when I tried that.

Both games make full use of a megabyte of RAM and have to reconfigure a model A310 to do so. If you leave the game by the correct channels this is undone and your original configuration is restored.

Word up Word down also has a free hidden game. Not the same as in Desktop Games, but a version of a game I have played on MS-DOS machines but with the added attraction of synthesised speech!

Startrader – Tone Otway

At last, a software package that is more challenging than the recent glut of 'shoot-em-up' games and avoids the stagnant nature of some Adventure games. Startrader combines elements of both and will inevitably be compared to the early Star Trek games and Elite.

The plot centres around an Armageddon device that will explode unless you collect the nine segments of the de-activation code. These are scattered around the universe (800 planets in 112 systems). In order to finance your search you must trade goods between planets, docking at planetary space stations. Docking is done in real time and needs a careful watch on your approach speed. Control is by the mouse using the centre button for thrust and the others for left and right orientation.

Having arrived safely (more on that later) and traded goods in order to buy extra goodies or simply pay for repairs, you can pay for use of the station's planet scanner. This gives you an estimate of whether there's a piece of code on the planet's surface. If the chance is good then you can beam down to the planet's surface – this costs valuable galactic credits and is the only way to collect pieces of code but the graphics and sound effects are fun.

As any galactic trader is aware, life is never easy, and frequently, upon reaching a planet, a voice warning of the enemy Kargan ships throws you into panic. Combat is in real time and is done by looking down upon your ship which is placed upon a grid. Whilst this lacks the cockpit simulation of Elite, the destruction of enemy craft is challenging and requires fast thinking and use of the "War book" to gain vital information on enemy craft. An energy control board is needed to distribute power to shields and weapons etc.

Practically everything can be done using the mouse, moving from menu to menu from what will soon become easily recognisable icons. Save game options are available from the master control panel and I would suggest that you make good use of them. Be warned — my version of the program crashed when I forgot to replace the program disc after saving.

The graphics are generally good but I had trouble reading the text whichever of the two fonts I chose and this is my only major grumble. The sounds effects are up to the usual Archimedes standard. The manual could be better — perhaps taking the player through a few encounters, but otherwise the icon descriptions are adequate for the learn-as-you-play approach which I tend to use.

Backing up is no problem and considering the amount of work involved (the program uses all 1 Mbyte of memory) I commend GEM for their trusting approach. Being somewhat disappointed with most of the Archimedes games so far (with the notable exceptions of Zarch and Conqueror) Startrader is a very welcome addition to my software collection. It's not the souped up version of Elite that I'd hoped for but it has its own attractions and I'd recommend it to anyone looking for a greater challenge than most games currently offer. A

Drawing Board Review

Steve Bruntlett

Drawing Board is a printer-based drawing package that outputs to most dot matrix printers and colour dot matrix printers. This is the main difference between Drawing Board and other drawing or graphics packages. Whereas the more readily available paintbox graphics packages are designed around the screen and feature screen based graphics, Drawing Board, with its object based graphics, is designed round the printer used to produce the final output.

Drawing Board is very much a self-contained package. The manual gives a few instructions on backing up the disc and instructions relating to the on-board computer manual. These are all the instructions necessary at this stage. Booting the disc presents a drawing grid on screen with an outline rectangle in the top left hand corner representing the part of the drawing being worked on. Drawings can be many times the size of the screen, so you need some indication of exactly where you are in a drawing. There is a line at the bottom of the screen giving information relating to the X-Y position of the mouse, the graphics option in use and the grid snap size.

Disc-based manual

Pressing <ctrl> loads the manual from disc into the computer and presents options to choose the next or last page, the index or to exit the manual to start drawing. The mouse is used to 'turn' the pages of the 80 page on-screen manual. The manual is split into an introductory section followed by a reference section. There are two appendices referring to drawing PCB layouts and using Library files. There is also a sample file of electronic components.

The manual also has a two page index, the pages numbers of which give direct entry to pages of the manual using the mouse for their selection. Other files on the disc include the file used to produce the Drawing Board advert (which you may have seen in Archive 2.2, page 9 — worth looking at to see the output quality possible) and a scratchpad file.

On leaving the manual by selecting exit, the main menu is accessed using <select> on the mouse. This main menu comprises a calculator, a notepad, shapes, text, paper and disc filing options. These are selected with the mouse as you would expect.

Printer set-up

As this is a printer-based drawing package, the best place to start is by setting up your printer correctly.

There is a small test-card image which, when printed out, is used to make sure the printer is printing out a drawing in the right proportions. After fiddling with the dip switches on my printer, a Canon 1080A, to turn the line feed off, I printed the test-card reasonably correctly by using the default printer driver, but not quite in the right proportion. I selected the EpsonFXQ driver, which gave me a better printout but the printout was not quite long enough. After referring to the manual and adjusting the vertical dots per inch from 180 to 216, I printed out a perfect copy of the testcard, the right size, 3 inches by 2 inches. The modified driver was then saved as the default driver so that it is now automatically loaded each time Drawing Board is run. Once set, no more changes had to be made to the printing procedure.

Using the Print Menu, drawings can be printed out in imperial or metric measurements, horizontally or vertically. They can be overprinted if your printer ribbon is a bit faint. In practice, fainter ribbons give better results than new ones, which tend to smudge too easily. The scale factor of the drawing as well as the left hand margin can be altered.

Pressing <menu> while on the Print Menu pops up the Printer Settings Menu. This gives details of the settings of your chosen printer driver and also allows the settings to be altered or amended to your own specification. The printer drivers cover most dot matrix printers but you can always write your own printer driver by altering the entries in the Printer Settings Menu.

Drawing

When starting work on a drawing, you can use black continuous lines without selecting anything from the main menu. The calculator works well and the notepad allows you to make notes as and when necessary. The Shapes menu allows you to use 8 textures on 16 planes for circles, squares, triangles, ellipses, continuous and individual lines either in outline or solid forms. These shapes can be snapped to a user-defined grid. There are also transformations, pads and tapes as well as two types of text.

The textures and shapes are straightforward. The use of planes will be more familiar to users of CAD packages, but in essence they allow you work in

separate layers if you need to for Computer Aided Design work or Printed Circuit Board design.

Text types

The text options allow you to use screen based text in a variety of user-definable sizes and in different proportions. The second option is the provision of access to the anti-aliased fonts provided on the Archimedes Welcome disc. These two fonts, Trinity and Corpus can be used in 10 different sizes but take a long time to print if there's a lot of this type of text. Though to be fair, this is one of the first graphics packages which allows you direct access to the anti-aliased fonts provided by Acorn.

Transformations

The transformation section of the shapes menu allows you to translate or move part of the drawing to a new position. Objects drawn can be copied to new positions. Objects or drawings, but not text, can be flipped vertically or horizontally about a central axis and can also be enlarged or reduced though some care is necessary with this last option if you are unfamiliar with object based graphics.

The pads are filled circles with definable radii of any chosen texture. Six pads are pre-defined but can be altered to fit in with the drawing in progress. The tapes are lines of texture, again in pre-defined but user-definable thicknesses. The tapes may be useful in general drawing but the pads are perhaps more use in PCB design.

The translation section is the most difficult part of the package to get to grips with, especially if you've not come across object based graphics packages before, but with a bit of perseverance, the initial difficulty is more than compensated for by the facility to have the same high quality of line and shape irrespective of degree of enlargement.

Conclusion

This package has a lot going for it if you want to produce CAD work, PCB designs or presentation graphics. If you want to produce CAA (Computer Aided Art) then it might be another matter, but it will be interesting to see just how far Drawing Board can be pushed in this direction. It produces very high quality graphics and reasonably good text. The computer based manual is wonderful

though it would be nice to have it available as hard copy for reference. Other software houses please take note. The package is that much easier to use as a result of having the manual indexed and accessible on screen at any time. It even stays open

at the same page from the last time you used it. Conclusion? This is definitely to be recommended!

Drawing Board – by Jansons – £59 including VAT and p&p (£52 through Archive) A

Using Hard Disks

Keith McAlpine

After using a floppy disc system for over a year on my Archimedes, I finally took the plunge and sent off for an Acorn hard disc system. After tentatively installing the drive (a tight fit with the 4-slot backplane in my Archimedes!) and running the soak test software (lasting 12 hours) I was finally ready and raring to go!

After floppies, a hard disc is a joy to use. No more frantic searching for that disc with the modules I needed on it, no more "Disc Full" error messages (at least not yet...), and no long delays every time I tried to run the C compiler.

Over the last few weeks, however, little problems have reared their ugly heads. It is quite easy to 'lose' programs amidst lots of other programs, unless you keep a methodical and not too full directory structure. I have adopted one where the root directory consists of only directories – Library, Compiler, Art, Games, Utilities, Apps and Developmnt. In these directories the categories are further subdivided into other directories. For example, in the 'Games' directory I have other directories called 'WordUpDown', 'PacMania', 'StarTrader', 'Quazer' and so on. It is only in these directories that the actual programs exist.

The problem with this method, especially with Games, is that they often reset the computer, running the !Boot program in the root directory. The problem was that each game needed its own '!Boot' program in the root directory, and how would it know that the program that used to be in '\$.Library' was now '\$.Games.WordUpDown.Library'? I solved this problem by changing the !Boot programs of each of the games and writing a small, universal reset and !Boot program.

The basic idea is simple. Instead of a program just <ctrl-break>ing from a small routine in its !Boot program, set a flag to show which program number

it is and then run a further program which will store this flag in CMOS ram, set up the special !Boot program and then do a <ctrl-break>. Listings 1 and 2 represent the <ctrl-break> program and the special menu program.

When changing the !Boot programs, in the line before the program does a <ctrl-break> (e.g. before a line saying CALL reconfig or CALL rand_usr_0 etc.) enter a line saying:

```
Z%=<progrnum>:  
      CHAIN "$.Library.CtrlBreak"
```

Z% is the variable I use for saying which program should be run from the universal boot program. Each program should have a number between 0 and 255, making sure that each follows one after another (0,1,2... not 0,4,2,1...). Some !Boot programs also disable some modules – make sure that the module 'Podule' is NOT disabled otherwise the Arc doesn't think you have a hard disc any more! I have found that a bit of trial-and-error with !Boot programs will eventually get them into a state where they are usable on hard disc systems.

All is not yet finished, though. Note down on a piece of paper the <progrnum>, directory structure of the !Boot file and the program you want to run after the reset (e.g. 0 – \$.Games.WordUpDown – !Boot) – this last name is normally always !Boot. Then put this information into the data list of the !MenuBoot program, starting with program 0 and commencing upwards.

Some programs set up certain system variables when they are run, and these may also have to be changed. These set ups are normally found in the Library.<progrname> file on disc. For example, in 'Word Up Word Down', the Library.WordUpDown program contains the following lines:

```
*SET WordUpDown$Resources $.Resourc  
es.WordUpDown  
*SET WordUpDown$Data &.WordUpDown
```

Using Hard Disks

These lines had to be changed to:

```
*SET WordUpDown$Resources $.Games.  
    WordUpDown.Resources.WordUpDown  
  
*SET WordUpDown$data $.Games.  
    WordUpDown.WordUpDown
```

and only then would the game work. Also make sure you have *Configured your drive to 4 and that it has a *OPT 4,2 option setting.

Some software is unfortunately copy protected and, unless you break the protection somehow, these are destined to stay on floppies.

After all that, you may be wondering, "How am I going to remember all those directories!" to which the answer is simple, you don't. Using the system variable Run\$Path you can set up exactly what directories the computer looks into. For example, I have a small *EXEC program called 'Fun' in the Library directory, which only consists of 2 lines:

```
*MOUNT  
*SET Run$Path $.,$.Games.,$.Art.
```

Thus, to run say, 'Pacmania', I only have to enter '*fun' only once after a <ctrl-break> and then
*pacmania.!boot

and the computer automatically finds the right directory. Also, as RISC-OS becomes more available and the desktop gets used more, just clicking on the respective icon is all that is needed – so long as you use meaningful filenames!

Having the *MOUNT command means the computer will always check the Library directory, which is where I keep most of my small setup routines.

By now you should be finding it possible to save a game and load in a spreadsheet or whatever by the time it takes the boss to open the door and walk into the room you are in. Every so often, however, I have found that the hard disc podule disappears, resulting in a 'Disc error &3A' when you try to access the hard drive. To recover the podule, without resulting to the rather drastic R-On/Off, use a mixture of *RMreinit Podule and <ctrl-reset>, depending on the circumstances.

One final note, always remember to park your drive heads after use. I personally don't like the *BYE command as it doesn't tell me that it has done its job so, just for my own satisfaction, I use a small BASIC

file called 'CloseDown'. This is shown in listing 3. You may also wish to include some *Configure options in here, maybe *Configure Drive 4 or *Configure Boot, so that the machine is set up as you want it when you next switch on.

As I have only had my drive for a few weeks, I am sure many other people have their own layout for how their hard disc systems are set up. This method, however, is a way of not having to type in endless *Configure commands before you run a program and I hope is of use to some people.

```
10 REM >$.!MenuBoot  
20 REM Universal !Boot routine  
30 REM This program is called after  
      the <ctrl-break>  
40 REM by Keith McAlpine  
50  
60 *RENAME $.!Boot $.!MenuBoot  
70 file=OPENIN"$.!OldBoot":CLOSE#file  
80 IF file<>0 THEN *RENAME $.!OldBoot  
      $.!Boot  
90 SYS "OS_Byte",161,36 TO ,choice%  
100 DIM menu$(255),dir$(255)  
110 lp%=0  
120 READ name$,dir$  
130 WHILE name$<>"All_Done"  
140   menu$(lp%)=name$:dir$(lp%)=dir$  
150   lp%+=1  
160   READ name$,dir$  
170 ENDWHILE  
180 OSCLI"DIR "+dir$(choice%)  
190 OSCLI "RUN "+menu$(choice%)  
200 END  
210  
220 REM The data layout is:  
230 REM DATA file to run in directory,  
      directory structure  
240 REM e.g. DATA !Boot,$.Games.  
      WordUpDown  
250 REM Remember to do the entries in  
      ascending order of <prognam> (Z%)  
260  
280 DATA All_Done,All_Done :REM The  
      last data item  
  
10 REM >$.Library.CtrlBreak  
20 REM Routine for any program to  
      call before it control breaks  
30 REM This means adjusting the  
      appropriate !Boot programs to
```

```

40 REM CHAIN "$.Library.CtrlBreak". 220
    Before this, however, set Z% 230 DEFPROCreconfig:DIM code% &100
50 REM to the number specific for 240 FOR PA%=0 TO 2 STEP 3:P%=code%:
           that program. [OPT PA%
60 REM by Keith McAlpine 250 .ctrlbrk:MOV R0,#200:MOV R1,#3:
70 REM (C)1989 GEM Electronics All 260 MOV R0,&#03800000:LDR R1,[R0,#0]:
           Rights Reserved 270 STR R1,[R1,-R1]:SWI "XOS_EnterOS"
80 MODE 0 280 ENDPROC
90 *REMOVE $.!OldBoot
100 file=OPENIN("$.!Boot") :CLOSE#file
110 IF file<>0 THEN
120   *ACCESS $.!Boot WR
130   *RENAME $.!Boot $.!OldBoot
140 ENDIF
150 *ACCESS $.!MenuBoot WR
160 *RENAME $.!MenuBoot $.!Boot
170 *CONFIGURE DRIVE 4
180 PROCreconfig
190 SYS "OS_Byt",162,36,Z%
200 CALL ctrlbrk
210 END

```

NEXT PA%

```

10 REM >$.Library.CloseDown
20 REM Type 'CloseDown' just before
           switching off your computer.
30
40 *BYE
50 PRINT "Hard disc heads parked.
Switch off the computer NOW." A

```

Alpha-Base – A Beginner's View

Peter Clements

When I volunteered to review this software, I didn't know what I would be letting myself in for, never having used or set up a database before. So you'll appreciate the fact that I won't be making comparisons with others, which is probably, not a bad thing.

When the program has loaded, you are presented with a very classy main menu screen, which, like other software from Clares, has the now familiar coloured icons denoting the choices available. Some of these however, aren't too clear as to their function, but by clicking the adjust button with the pointer on anywhere but the icons, they are replaced by text legends. I found this out just by chance although it is in the manual. The menu button can also be used when the pointer is over an icon, this reveals a help window at the bottom of the screen. There is also an on screen clock which shows the date and the time, a nice feature but one that can only be seen from the main screen.

Getting started

I, like most people, jump into a program without consulting the manual and although this is what I

started to do on this occasion, I found it better to go through the manual while sitting at the computer. Understanding the structure of the database is surprisingly simple. Each record can have up to sixteen pages with as many as 400 field titles. The number of pages that you have in a record govern the number of records in a file, in turn, governed by the amount of free space on the disc.

Armed with this in mind, I clicked on the 'newfile' icon. It is probably better at this stage to rough out on a piece of paper the order of the field headings that you want. However, these can be changed at a later stage if you find that you have forgotten something.

When page one appears, you can position the pointer anywhere that you require a field title; a sub menu then appears enabling you to choose between five different types of field; string, integer, real, date and formula. The latter is extremely useful as it allows calculations to be made on the information held in the records. Having selected the field type, you can now define its length by dragging a bar across the screen. The line length is shown in characters at the bottom of the screen and is updated as the pointer moves.

When you are happy with your page layout you can click on the OK box. This returns you to the disc filing menu where you can save your file. A message then tells you the maximum number of records which could be stored on the disc. If there are enough for your needs you can say yes, in which case you can specify how many you actually need, otherwise you can say 'no' and you will be prompted to try another disc. It is also possible to encrypt your file and stop prying eyes looking at your information but you must remember the password as it is not held on the disc.

Sample database

A good idea is to look at the file called 'DEMO' on the disc. This is a database of fictitious names and addresses and is a good example of how to set up a database. As this shows, a record can be kept of 'club members' and can include their birthdays, and when they joined and provide information as to their ages at the present time and how long they have been a member. I was amused to see that they have included my old school among the 'fictitious' entries.

To test myself on what I had learnt so far, I created the structure of a database from scratch. The idea being to put the software to the test, especially the search mode. I decided to make a file of British birds. I consulted The Observer's Book series and found that I would need a file length of some 236 records approx. I set out the field titles: BIRD, FAMILY, LENGTH, HAUNT, NEST, etc. and found that I had more than enough room on the disc. I entered about a dozen or so, (I wasn't going to enter them all) and selected the search mode.

Searching through the data

The search mode is a powerful option which offers you four different search types; field, record, minimum and maximum. I chose record which enables you to search on the whole record. I knew I had typed somewhere in the record, 'pinkish plumage', but didn't know for what bird. So I just typed in part of the word and it found two birds that had that particular colouring. It is possible to carry out a search on up to 9 fields simultaneously, with an optional constantly updated screen display showing how many records have been matched.

Printing the information

Once a record has been found, you will probably want to print it out and AlphaBase allows you to do so in a number of formats. You can, for example, specify the order that you want the fields to be printed, the screen display itself or, printed as labels. The print menu is clear and very easy to understand and it is possible to have full control over the page layout. If a mistake is made while using the software, whether it be for printing, record structure, entering data etc. then it's a simple matter of pressing <escape> and you are returned to the main menu.

I can't recommend this program enough! AlphaBase is very user-friendly, with on screen prompts etc. The screen display throughout, looks smart and the manual is clear and concise and actually contains an index. It should appeal to anyone new to databases, who needs to keep records in order, whether it be for a stamp collection, a video library, or for names and addresses. Buy it! You won't be disappointed. **A**

Small Ad's

Second Floppy – Second floppy drive, sale due to up-grade to hard disc, £80. Ring (0306) 885650.

First Word Plus £60 and **SigmaSheet** £45, both only slightly used. Ring Alan Fitzgerald, 0582-413057.

Graphic Writer – as new – with registration card – £15.00. Phone Andy on 01-733-3590

Archimedes 310 colour, as new, only £945. Sanyo 14" RGB monitor for BBC micro, £105 ono. Bedford (0234) 267067, evenings.

System Delta Plus £35 or HFI 130. Phone Philip Green on: Rotterdam 4023360 (7:00 to 15:30 central European time).

Kaga Taxan 810 printer, approx 3 years old, ex. cond. £120, 0454-322138.

Archimedes standard colour monitor, £120, (owner upgraded to M/S monitor), 10 months old, complete with leads. Ring Des Woon on Harwich 0255-880257. **A**

Reporter – Relational Database

Rob Brown

Having found that Minerva Systems had the above software available at the recent BBC Micro & Electron User Show, I purchased a copy of same – even though the manual was not then available. The following brief comments may be of interest.

I found that it was possible to combine all the System Delta Plus and Reporter programs on to the one back-up "program" disc, including both sets of demonstration files – except for the System Delta Plus 'Products' file. The original Reporter disc can then be put away in a safe place as only the original System Delta Plus disc is required to be briefly inserted in the disc drive as part of Minerva's protection system.

I was pleasantly surprised to find that even without the manual and with just a bit of "trial and error", I was able, fairly quickly and easily, to create and print various reports from my existing System Delta Plus files. When the manual did arrive, (2–3 weeks later, as promised at the Show) I found little in it that I hadn't already discovered. This manual, which runs to just under 50 pages, is supplied ready

punched to fit inside the existing System Delta Plus manual's ring binder.

Whilst it is possible with System Delta Plus to create fairly simple printed reports by using the 'List Cards' function, the end result is rather limited and is probably best "massaged" by creating a file on disc for import into another word-processor or spreadsheet. Reporter provides fairly comprehensive facilities for creating printed reports and previewing them on the screen. These additional features include totalling/sub-totalling, multiple-format columns and loading and saving of report layouts. Additionally, it is possible to create one combined report from two System Delta Plus files – providing obviously that there is a data field common to both files. Printing of the finished report can be a little slower than normal as, within each line, each column is printed separately.

However, whilst Reporter does add a number of very useful additional facilities to System Delta Plus, at £39.95 (£37 through Archive) it does seem a little pricey – particularly in relation to the cost of System Delta Plus itself at £69.95 (£62). A

Eizo Multi-sync Monitor

Basil Davis

- Eizo FlexScan multi-sync monitor supplied by Watford Electronics. Price £459 + VAT + Courier despatch.
- Light grey case with swivel/tilt base (2 screw fixing) weight 13 kg. Overall dimensions (with base) 356 mm(W) by 400 mm(D) by 380 mm(H) – the base accounts for some 40 mm of the height.
- Black non-glare screen – dimensions 272 x 200 mm (14" diagonal) with a dot pitch of 0.28 mm.

The monitor will handle both RGB (TTL) and analogue inputs – selection being by a switch at the side where other switches cater for the various IBM graphics modes. The horizontal scan frequency range is from 15.70 to 35 kHz with a vertical scan frequency range of 50 to 80 Hz both being automatically selected. The quoted risetime of 15 ns

indicates an amplifier bandwidth of about 22 MHz. Maximum resolution is given as 820 x 620.

The vertical and horizontal shift controls are at the rear with the remaining controls conveniently placed at the front. These are thumbwheels and comprise:-

- ON/OFF push button switch with pilot light (Green for Analogue – Orange for RGB)
- Brightness & Contrast (no position markings).
- Colour / Text switch 3 position – Amber / Colour / B & W.
- Vertical Size which has a notch at mid-range but no position markings.
- Horizontal Size – 4 position with no markings.

The vertical size control gives a minimum picture height of 135 mm – at maximum the screen is overscanned.

In type 1 monitor configuration the horizontal size switch gave the following display widths (Position 4 is fully clockwise) :-

Mode	1	2	3	4
0	240	228	223	214 mm
16	262	250	244	234 mm
18	228	220	214	210 mm

There is a shift to the right of some 26 mm on switching from Mode 0 to Mode 18. About 6 mm of this is accounted for by the display shrinking in size by 4 to 5% despite the handbook claim of automatic size adjustment. With normal scan rates (Mode 0) position 3 gives a picture size of 223 x 179 mm (vertical size control at the mid position) as compared with 214 x 171 mm in Mode 18. Switching the horizontal size to Position 1 restores the width to 228 mm requiring adjustment of the vertical size (to 182 mm). If much work is to be done in Modes 16 to 20 the horizontal Shift will have to be adjusted or the text modes will suffer clipping at the left hand edge. It is possible to keep the complete scan within the screen area for all modes but it will not be centred.

Pro's and Con's

Brightness and contrast ranges are good – linearity and stability excellent. With a grid display, the cell dimensions and shapes are uniform over the whole display. Colours are bright and clean and show no smearing with a 7-colour bar display (in a 16 colour mode). A flashing display shows no apparent persistence. The case is only just warm after 2–3 hours use there being no signs of excessive temperature rise. The provision of an amber tint for text processing is useful, particularly with the 132 x 32 and 80 x 64 modes although with the colour or B & W options the characters are still perfectly clear and legible. A good test is to print a screenful of 'MW's when each character should be legible. The monitor passes this test. The handbook is adequate, there being only a few obvious misprints but what exactly is meant by the statement that the colour/text switch provides "B & W in 4 shades"!?

Against these good points we must put the picture shift and lack of markings on the controls which makes it difficult to restore preferred settings. It is possible that there may be internal presets to overcome the shift and picture shrinkage problems but this has not been checked. A

Current Directory Code Variable

Ray Loades-Bannon

Archive 2.3 (Jan 89) contained an article showing how to write a relocatable module to maintain an Arthur variable called 'Curr\$Dir' which would always contain the name of the current directory on the current filing system. This article describes an alternate method of producing the same result without using a relocatable module.

There are four ways to define a variable in Arthur, the first three of which may well be familiar :

```
*SET Name Ray
  **SHOW Name' will return 'Ray'
*SETEVAL Hello "Hello <name>""
  **SHOW Hello' will return 'Hello Ray'
*SETMACRO Hello "Hello <name>""
  **SHOW Hello' will return 'Hello <name>'
```

Code variables

The fourth way of defining a variable is to assign a piece of code to be used whenever its value is

written and/or read, this is a 'code variable'. This method means we can set up a piece of code which will, for instance, read the current directory name from the filing system and return this value every time the variable is read.

Unlike the other three types, the code type of variable cannot be set up from command line interpreter but must be assigned using a SWI. The SWI in question is "OS_SetVarVal", which sets, creates and deletes variables. Here we are only interested in the setting/creating of a variable. This SWI takes the following register values :

- R0 = pointer to name of variable
- R1 = pointer to value to assign (for a code variable the start of the code)
- R2 = length of value to assign (for a code variable the length of the code)
- R3 = name pointer (0 to set up a variable)

R4 = variable type, 16 = Code (a value from 0 to 3 is used to set up an ordinary variable)

When R4 is 16, a code variable will be set up. R1 must contain the start address of the pre-assembled code which will be used to handle the variable and R2 the length of the code. The code pointed to will be copied into the system heap so it must be relocatable. The code will be used for two purposes, to read the value of the variable and to set it. The code must be in the following format :

Offset Contents

00	Branch instruction to variable write code (MOV pc,R14 if no write code)
04	Start of read code (MOV pc,R14 if no read code)
08...	Body of code

This is very simple compared to all the header gibberish needed by a relocatable module. The parameters passed to and from the read and write routines are documented in the example program.

The example program assembles and saves a small utility program which will install a variable called Curr\$Dir. The code is in two parts, the first is a small loader routine which simply calls OS_SetVarVal with the correct parameters to set up the variable, and the second part is the actual code used to read/write the variable. The loader could be in any language but is simple enough in ARM assembler and as a transient (type FFC) it will not affect the current environment when run, as for example a BASIC loader would.

Once the loader has been run, the variable Curr\$Dir will always return the currently selected directory name in the current filing system. This can be used in exactly the same fashion as the Curr\$Dir variable in the current directory module article. So why use this method rather than the relocatable module method? Here are some advantages:

- 1) The ARM code is more understandable, just a small loader and the code needed to do the job in hand
- 2) The method is more flexible, since the read/write code can do anything, within and without the bounds of reason, every time a variable is read/written

3) No need to worry about hard/soft resets etc, the code will be clobbered by the operating system at the same time as the variable

4) It is small, the total code for the loader in this example is only &68 bytes long and the actual code loaded into the heap is only &44 bytes

```

10 REM > CSDSrc
20
30 REM Author : Ray Loades-Bannon
40 REM Version : 1.00 - 12.1.89
50
60 REM Source code for m/c
      transient program which sets
      up a variable
70 REM called Curr$Dir which always
      returns the current directory (CSD)
80 REM See P.R.M.- OS_SetVarVal.
90
100 REM Add these lines to !Boot:
110 REM *CSD
120 REM *SETMACRO CLI$Prompt
      <Curr$Dir>=>
130
140 DIM code% &100
150
160 FOR pass%=0 TO 3 STEP 3
170 P%=code%
180 [OPT pass%
190 .CV_install ; Install variable
      handling code
200 ADR R0,CV_varname ; Pointer
      to name of variable
210 ADR R1,CV_start ; Pointer
      to start of code
220 MOV R2,#CV_end-CV_start;
      Length of code
230 MOV R3,#0 ; First call flag
240 MOV R4,#&10 ; 'Code' type
      variable
250 SWI "OS_SetVarVal" ; Create
      the variable
260 MOV pc,R14 ; That's all folks
270 .CV_varname
280 EQUS "Curr$Dir" ; Variable
      name (try KEY$1 then press F1)
290 EQUB 0 ; Null terminated
300 ALIGN
310
320 .CV_start ; Start of code to
      install in sys heap
330 B CV_write; By convention must
      jump to write bit
340

```

Current Directory Code Variable

```
350 .CV_read ; Code to read variable      520 ALIGN
360 ; On entry ---                      530
370 ; On exit - R0=pointer to value      540 .CV_write ; Code to write
380 ;                   R1 may be corrupted   variable (duplicates *DIR)
390 ;                   R2=length of value    550 ; On entry - R1 = pointer to new
400 STMFD R13!, {R14,R3-R4}; OS_GPB      value
410 MOV R0,#6 ; Read CSD call           560 ; R2 = length of value
420 ADR R2,CSD_read_buffer; Buffer       570 ; On exit - R1,R2,R4,R10-R12
430 SWI "XOS_GPB" ;Must be X type        may be corrupted
440 ADD R0,R2,#2 ; Return pointer        580 STMFD R13!, {R14,R0}; Don't
450 LDRB R2,[R2,#1] ; Return length       corrupt R0
460 LDMFD R13!, {pc,R3-R4}; Sock it      590 MOV R0,#0 ; Write CSD call
470 .CSD_read_buffer ; Format of         R1 is set O.K. already
480     buffer returned by XOS_GPB, #6   600 SWI "XOS_FSCControl" ; Errors
490 EQUB 0 ; Zero byte                  are passed back with V set
500 EQUB 0 ; Name length                610 LDMFD R13!, {pc,R0} ; Dunnit
510 EQUS "Maximum Name" ; Current      620 .CV_end
520 directory name                     630 ]
530 EQUB 0 ; Privilege byte            640 NEXT pass%
540                         650
550                         660 REM < Now write code as file
560                         type FFC (transient) >
570                         670 SYS "OS_File",&0A,"CSD",&FFC,
580                         CV_install,CV_end
590                         680 END A
```

Money Care Program

Glyn Emery

The owner of a personal computer who wishes to use it to handle his personal finances has a choice. He can buy a spreadsheet and design a system that exactly fits his own requirements, or he can save himself time and effort by buying a system designed by someone else and hope that it matches his requirements closely enough. One such is the 'Cares' disk from Squirrel Software (£34.95).

This particular disc is based on a spreadsheet written for the BBC Micro and it runs under the emulator on the Archimedes. Nevertheless it runs reasonably fast; though there are a few delays that suggest that it ought to be converted to a native Archimedes system as soon as possible. (*See below. Ed.*) Spreadsheets are provided to handle VAT, bank accounts, building society savings and investments in securities. I bought the disc to deal with a portfolio of shares and regard the rest as a bonus. After all, the disc costs only the equivalent of a year's dividend on about a thousand pounds worth of shares or, to put it another way, might legitimately be set against a year's tax on about four thousand pounds worth of shares.

Investments

The investment program does just about all that the average investor wants. It keeps a record of purchases and sales, and calculates capital gains or losses. The purchase (offer) price, original cost and number of shares are linked; so, if you enter the price you actually paid, it will work out a notional offer price that includes dealing costs.

The system revalues the portfolio whenever the user feels like entering a current set of bid prices. It does not keep a record of all bid prices entered, only the highest to date and the latest for each security. It compares the two to assist the user in deciding whether or not to sell. If you want a history of price movements you can hold each valuation in a separate file. Calling for a barchart then searches for information in all the relevant files and displays past performance.

Banking

The system is designed for someone who has two current accounts and might pay bills from, or bank cheques into, either. The handbook says that the display looks like a bank account. This is

misleading, as it is a spreadsheet and all dealings with, say, Norwich Computer Services must therefore appear on the same line every month. There are only 60 categories, 20 for income and 40 for expenditure, which is unlikely to be enough, particularly if you have a lot of items that occur only once a year. Twelve monthly accounts are recorded; and the year can start in any month. Files can be protected by password.

A feature called "analysis" enables the user to enter a single payment (e.g. by Access or Visa) or a single receipt and then split it into separate categories. I do not really see the point of this. I would have preferred the reverse process ("synthesis") whereby I could combine several dividend payments, or several cash withdrawals from the ATM till, into single items for the month. The program can be made to give an annual summary of the totals in each category for the two accounts taken together; and the total income and expenditure for the year are given, together with a balance. You can also get bar charts showing the monthly totals for any selected category. Unfortunately there is a bug that prevents the pointer on the totals display from being moved once a bar chart has been displayed. If you want to compare your monthly spendings with Beebug with those with Norwich Computer Services, you have to go all the way back to the main menu between one barchart display and the next.

Building Society

The purpose of this system seems to be to enable the user to keep track of the type of account that calculates interest on the daily balance. However, since the user does not know when his balance is actually updated (i.e. whether when a cheque is banked, when it is presented, or when it is cleared) his own calculations are unlikely to agree exactly with those of the building society. Nevertheless the program does give some idea of what is going on.

VAT

Each display, covering three months, gives up to 32 pages of 15 items each both for purchases and sales. The system calculates VAT on each item and there is a totalled display showing how much the user has to pay the tax man. Printouts are available for the user to include with his returns. Not being VAT registered I had to use the test file supplied to see

how well this works. Unfortunately the file contains only purchase data, so I could not check the system properly even then.

Critique

I bought the disk to help me to look after my investments and it does this for me admirably. I also like to know how my income and spending balance month by month and how much I spend in various categories. The cash-care (banking) spreadsheet handles this very well; though I have had to invent a notional account called Abbifax for the purpose. The building-society spreadsheet is not so useful. The amounts involved in my case are small, since most of my building-society money is on three months call and untouchable except for emergencies. The VAT spreadsheet looks useful and could well prove a boon to anyone with this particular headache.

The manual leaves something to be desired. It took me quite a while before I learned how to enter data, particularly when some null entries were involved. The manual rather tends to assume that the reader knows how to use this particular spreadsheet (without even telling you which it is). Indeed some users may not even have met a spreadsheet before. The style is not all that clear and the problem is compounded by the use of "they" for he/she (or even, why not? just "he").

My chief criticism is that the four spreadsheets are completely independent. This does not really accord with my needs. In my case every dividend cheque received has to be recorded in the investment spreadsheet and deposited in the building society as well as being recorded as income. This means typing in the same data three times, with three opportunities for error. It should have been possible to devise some way to copy an item from one spreadsheet to the others. One good feature, sadly omitted from many utilities, is that one can interject star (OS) commands while using the spreadsheets. Perhaps this could give a possibility to transfer the same data between spreadsheets. I shall have to experiment when I get the time. A

Squirrel Software have informed us that the software has been fully converted for the Archimedes and is now working entirely in native mode – not an emulator in sight! Ed.

Shares and Accounts Program

Martin Smith

Shares and Accounts, Version 2.1, £15 from IH Software.

I have been using both programs for some six weeks and find them easy to use and they give a greater degree of flexibility than I can get out of the set up I had established on a Logistix sheet. On booting the disc, you are asked to enter your three letter personal code. There are clear instructions on how to set up your own code. I would suggest that you tell it you want to have both programs as I found it confusing adding an accounts program at a later date.

The first user has the whole shares program to set up with details of the shares or unit trusts, their prices, highs, lows, P/E ratios, spread, trading costs, yield and may group them together and classify them. Further users who have their own code can enter their holdings of any shares/units they have bought and look at the details of prices and their fluctuations which are normally entered by the master user each week and processed by the program.

All users have the facilities to buy, sell, enter script issues and generally to regulate their own portfolio. It will provide a graph of each share or calculate your total holding and show gain/loss on both individual and totals. Each user has their own portfolio but shares cannot be entered that are not on the master users list.

If an error has been made in entering a purchase or sale, it can be updated. I found this very useful as I forgot that prices were all in pence and had a number entered in pounds and pence. It takes decimal places on shares and on units to any price I have tried. I find it prints out perfectly on to my NEC CP7 printer but I understand that it was set up for Epson printers.

Nearly all operations are mouse or keyboard controlled. For shares starting with an early letter in the alphabet I use the mouse but the keyboard is quicker for later in the alphabet. The windows are clear and explicit leaving little room for error. Incorrect three letter codes are refused entry but it is quite easy to find out the codes in use with the aid of DUMP or *LIST. I do not see the security codes as

being anything other than a facility to stop the casual user from viewing your personal files. If you forget your user code you will need to look up the code in the SAUSER file.

Accounts program

The accounts program is for personal accounts and can give you your complete worth if it is given access to your share details and you enter all your separate bank, building society and other accounts. It will allow you to classify many different accounts of different types complete with all the transactions you make whether by cash, cheque, direct debit or standing order with reminders that DDs or SOs are due soon.

So far I have only used it to handle the purchases, expenses and receipts on two holiday properties we have in Cornwall. It does the job surprisingly well considering that it is not designed to handle other than personal accounts. Again it graphs out the details by month showing the last few years and also forward receipts which is very handy for deposits because they show up in a different colour if they are for the next year. At the year end all the totals show for the year in which they are dated. The totals can be held for four different years. It has reminder facilities for when a bill is due or for any future occurrence and this can be done at set intervals.

I found that the facility for mouse clicking on the block headings on the Master Menu which gave the option of a total of 15 Help pages was most useful particularly as you can then use the <print> key to get a hard copy. The printing out was slower than is usual for my printer but this is because it was dumped line by line so that graphs can be printed as well. It is well worth the time as you can then refer to the notes while viewing a different screen.

Overall I find it a useful disc and would recommend it for its ease of use and general user-friendliness. The full cost is £15, which is really cheap for such a useful package, and I believe is to be offered for £12 for this month only, so if you own shares or want to monitor your accounts, don't wait. A

File Types Utilities

Jonathan Marten

Data files on disc can be of different types as indicated by a 'type' number which is encoded into the load/execute addresses of a 'stamped' file. This number indicates what sort of data the file contains. Some type numbers are already allocated and used by Acorn, while others are available to software houses and the user.

This module performs two functions:

1. It recognises additional file types allocated by the user or a software house and providing a decoded text string representation. This provides a far more useful display when you use an EX or similar command than the default '&xxx' for an unknown type.
2. It provides a FileTypes command to list all the known file type codes. Useful for knowing what number to give when using SetType.

Module format

The module has the standard header format. The initialise and service entries are used and the command table contains one command. Standard help and syntax messages are included.

The initialise entry (label .init) prints the module's title string, to confirm what has just been loaded.

File Type Decoder

This routine is entered as the result of a service call. When the filing system manager wishes to decode a file type into a text string, it calls this entry with a reason code of &42 (in R1) and the unknown file type in R2. If the module is being called for this reason, the routine beginning at label .lkup searches the type table (label .table) for that type. If it is found, the appropriate text string is loaded into R2 and R3 to be returned and R1 is cleared to indicate that the file type is valid. If the file type is not known, the service is passed on by preserving R1 – some other module may claim it.

Any number of personal file types may be added to the table, in the same format as the existing ones. The table must be terminated by a zero word.

File Type Lister

The module also contains a *FileTypes command,

which lists the decode strings and hex values of all the known file types (Acorn, third party or user). Starting at label .list, it simply calls the "decode file type" service routine for all possible file types (i.e. the range &000 – &FFF). If the service is responded to, the returned name is printed (by calling OS_WriteC in turn for the eight characters of the name) and then the hex equivalent (via OS_ConvertHex4 and OS_WriteN).

Whether the type was recognised or not, the loop continues until all types have been checked. To loop through all 4096 types takes less than a second (I should think so too!).

The output of the command will be something like:

*filetypes

Installed file types:

Label	&001
Pointer	&002
BBC ROM	&003
Marker	&004
Archive	&DDC
DeskUtil	&FE0
Palette	&FED
Note pad	&FEE
Diary	&FEF
Font	&FF6
BBC Font	&FF7
Absolute	&FF8
Sprite	&FF9
Module	&FFA
BASIC	&FFB
Utility	&FFC
Data	&FFD
Command	&FFE
Text	&FFF

The ones with a first digit of &F are the standard types installed; the others are recognised by this module.

```
10 REM > FileType
20 REM Utility module for handling
      user file types (C) JJM 1988
30 REM (a) Decode personal file
      types into text strings.
40 REM (b) FileTypes command to list
      all installed file types.
```

File Types Utility

```
50
60 DIM code &1000
70 pc = 15 : sp = 13 : link = 14 : wp = 12
80 FOR pass = 0 TO 3 STEP 3 : PROCasm(code,pass) : NEXT
90 OSCLI "SAVE $.Modules.FileTypes "+STR$(code)+" "+STR$(P%)
100 OSCLI "SETTYPE $.Modules.FileTypes &FFA"
110 END
120
130 DEF PROCasm(code,pass)
140 P% = code
150 [OPT      pass
160
170 \
    Module header, command and help tables
180 .start   EQUUD    0          \ Start code
190         EQUUD    init-start  \ Initialisation code
200         EQUUD    0          \ Finalisation code
210         EQUUD    service-start \ Service call
220         EQUUD    title-start \ Title string
230         EQUUD    help-start  \ Help string
240         EQUUD    cmd-start   \ Command and keyword table
250 .title    EQUUS    "FileTypeUtils"
260         EQUB     0
270         ALIGN
280 .help     EQUUS    "File Type Utils 1.11 (20 Nov 1988)"
290         EQUB     0
300         ALIGN
310 .cmd     EQUUS    "FileTypes"      \ Command name
320         EQUB     0
330         ALIGN
340         EQUUD    list-start   \ Code offset
350         EQUUD    0          \ Flags (no parameters)
360         EQUUD    synmsg-start \ Syntax error message
370         EQUUD    hlpmsg-start \ Help text
380         EQUUD    0          \ End of table
390 .hlpmsg   EQUUS    "**FileTypes lists the string decodes and numeric "
400         EQUUS    "values of all the file type stamps currently known."
410         EQUB     13
420 .synmsg   EQUUS    "Syntax: *FileTypes"
430         EQUB     0
440         ALIGN
450
460 \
    Initialisation routine - identify ourselves
470 .init     STMFD    (sp)!, {link}
480         ADR      R0,help
490         SWI      "OS_Write0"      \ Print title message
500         SWI      "OS_NewLine"
510         LDMFD    (sp)!, {pc}
520
530 \
    Service call entry point
540 .service  CMP      R1, #42           \ Check for "decode file type"
```

```

550      BNE      ret
560      ADR      R6,table
570 .lkup   LDR      R5,[R6]          \ Get type from table
580      CMP      R5,#0
590      BEQ      ret               \ Fail if end reached
600      CMP      R5,R2           \ Check type given
610      BEQ      found            \ and stop search if found
620      ADD      R6,R6,#12        \ Step to next table entry
630      BAL      lkup
640 .found  ADD      R6,R6,#4         \ Point to string,
650      LDMIA   R6,{R2,R3}        \ load it
660      MOV      R1,#0           \ and claim the service
670 .ret    MOV      pc,link
680
690 \
700 .table EQUD    &001
710      EQUS    "Label"
720      EQUD    &002
730      EQUS    "Pointer"
740      EQUD    &003
750      EQUS    "BBC ROM"
760      EQUD    &004
770      EQUS    "Marker"
780      EQUD    &005
790      EQUS    "Mag Ctrl"
800      EQUD    &006
810      EQUS    "Mag Data"
820      EQUD    &007
830      EQUS    "Mag Src"
840      EQUD    &008
850      EQUS    "Mag Bin"
860      EQUD    &DDC
870      EQUS    "Archive"
880      EQUD    0
890
900 \
910 .list   STMFD   (sp)!,{link}     \ Save return address
920      SWI     "OS_WriteS"
930      EQUB    13
940      EQUB    10
950      EQUS    " Installed file types:"
960      EQUB    13
970      EQUB    10
980      EQUB    10
990      EQUB    0
1000     ALIGN
1010     MOV      R8,#0           \ File type being checked
1020     LDR      R9,fff
1030 .loop   MOV      R1,#&42        \ Decode file type
1040     MOV      R2,R8

```

File Types Utility

1050	SWI	"OS_ServiceCall"	1290	EQUS	"	&"
1060	CMP	R1,#0 \ Did	1300	EQUB	0	
		service succeed,	1310	ALIGN		
1070	BNE	unkn \ if not	1320	MOV	R0,R8 \ Number	
		type is unknown			to output	
1080	SWI	"OS_WriteS"	1330	ADR	R1,str \ Buffer	
1090	EQUS	" "			start	
1100	EQUB	0	1340	MOV	R2,#5 \ Buffer	
1110	ALIGN				length	
1120	MOV	R0,R2 \ First	1350	SWI	"OS_ConvertHex4"	
		four characters	1360	ADR	R0,str+1	
1130	SWI	"OS_WriteC"			\ String to output	
1140	MOV	R0,R2,LSR #8	1370	MOV	R1,#3 \ String	
1150	SWI	"OS_WriteC"			length	
1160	MOV	R0,R2,LSR #16	1380	SWI	"OS_WriteN"	
1170	SWI	"OS_WriteC"	1390	SWI	"OS_NewLine"	
1180	MOV	R0,R2,LSR #24	1400 .unkn	ADD	R8,R8,#1	
1190	SWI	"OS_WriteC"	1410	CMP	R8,R9	
1200	MOV	R0,R3 \ Last	1420	BLE	loop	
		four characters	1430	SWI	"OS_NewLine"	
1210	SWI	"OS_WriteC"	1440	LDMFD	(sp)!, {pc}	
1220	MOV	R0,R3,LSR #8	1450			
1230	SWI	"OS_WriteC"	1460 .fff	EQUD	&FFF	
1240	MOV	R0,R3,LSR #16	1470 .str	EQUD	0	
1250	SWI	"OS_WriteC"	1480	EQUD	0	
1260	MOV	R0,R3,LSR #24	1490]			
1270	SWI	"OS_WriteC"	1500 ENDPROC			
1280	SWI	"OS_WriteS"				

A

Hard Disk Backup Utility

Jonathan Marten

There have been numerous calls in Archive and elsewhere for a backup program to allow the contents of a hard disc to be copied to floppies. This program does just that; its major features are:

1. Provision for 'full' or 'incremental' backups, i.e. the ability to copy either all the files on the hard disc, or just those that have changed since the last backup.
2. Prompts for a new floppy to be inserted when the one being used is full.
3. Formats floppies (if a blank one is inserted) as required.
4. Copies the file under its full pathname (making directories as required) so locating files to copy back is easy.

Using the utility

Simply run the BASIC program HDBackup. It can be installed in the Library directory and run as a star command or from the Desktop.

It will prompt for source and destination drive numbers. The defaults are 4 (internal hard disc) to 0 (floppy). The source drive will now be scanned for the date stamp file \$.DumpDate, which indicates when that drive was last backed up. If this file does not exist, or has a bad time stamp, a 'full' backup will be done. If the stamp is valid, an 'incremental' backup will be done which copies only files which have changed since the last backup. When the dump is complete, this stamp will be updated with the current time.

Now insert (as prompted) a floppy disc and press <return> to continue. If the disc is blank, press <Y> to confirm that it is to be formatted, and wait. Then, if any existing files on the disc are to be deleted, press <Y> to confirm. Pressing <N> here will add the copied files to that disc without deleting any existing ones.

The disc will now be scanned for files to copy. If a 'full' backup is being done, all files are copied. If an 'incremental' one is being done, stamped files which are younger than the last dump date will be copied. If an unstamped file is found, you will be prompted as to whether to copy it; press <Y> to copy or <N> to ignore.

Since the selected files will be copied to the floppy under their original pathnames, any file of that name that already exist will be deleted. If there is not enough free space to copy the file, you will be prompted to insert another disc; you have the option to format or clear this as above.

When the backup is finished, the marker file on the source disc will be updated with the current time.

Maintaining backup data

The procedure that is followed in most computer installations is to take an incremental backup fairly frequently (every few days), adding new volumes to the backup set as required. When the incremental backup has grown to an inconvenient size (every month or so), a full backup is taken on another set of backup volumes and then the incremental backup set is reused from the beginning. This may well be a bit over-the-top for most users, so the procedure which I follow is:

1. To begin, take a full backup onto a clearly marked set of floppies. Number these starting from 1 and always use them in that order. All except the last will be (almost) full, with the last having some free space on it. About six discs are needed for 4 Mbytes of files.
2. Frequently (every week) take an incremental backup. Load the last-numbered disc and fill that first, then start another. Remember not to clear the disc when using a partially-filled one!

3. When the backup set has grown excessively large (about 8 discs), take another full backup by removing the file \$.DumpDate before running HDBackup and using the discs starting at 1 again.
4. It is a good idea, before taking a full backup, to look around the disc and delete any obsolete or unwanted files. This reduces the amount of data which has to be saved.
5. If it is necessary to recover a file from the backup, start looking for it on the highest-numbered disc and work backwards. This will ensure that the latest version is found.

This will keep the number of floppies required for backup down to a reasonable level. Note that valuable data (e.g. software which has been paid for, or something that has taken a very long time to type in!) should be copied onto a separate disc. Files that are no longer required (e.g. program source code) should also be 'archived' on separate discs.

How it works

The principle involved is simple: each directory is read, starting from the root (\$). Each file found has its time stamp checked, or the user is prompted, as appropriate. If it is to be copied, the destination disc is checked to ensure that there is enough space to create the file plus any directories which may be required. If there is not enough, the user is prompted to insert another disc and it is formatted if necessary. The file is then copied and any directories which do not exist are created as necessary.

For each directory found, the routine is called recursively to copy that tree.

Various SYS calls are used to manipulate the files; they are all described in the 'Filing systems' section of the PRM.

Alert readers of the listing may notice that I use an = on a line of its own to mark the end of a multi-line function, even if the real value return statements are buried within the code. This is simply my personal way of making the end of a function definition clearly visible – it will probably give a syntax error if this line is ever reached.

Hard Disc Backup

```
10 REM > HDBackup
20 REM Incremental volume backup
30 REM (c) November 1988 JJM
40
50 MODE 0 : COLOUR 0,4
60 PRINT """ Incremental Backup
           version 1.00"
70 PRINT " -----"
80 @% = 10
90
100 INPUT "Enter: source drive
           number [4]: " dr$
110 IF dr$="" THEN srccdrv$ = ":"4"
           ELSE srccdrv$ = ":"+dr$
120 INPUT "Enter: destination drive
           number [0]: " dr$
130 IF dr$="" THEN dstdrv$ = ":0"
           ELSE dstdrv$ = ":"+dr$
140
150 PRINT "Info: backing up drive "
           ;srccdrv$;" onto drive ";dstdrv$
160 PROCddate
170 IF full THEN
180   PRINT "Warning: problem
           reading last date, dumping
           everything"
190 ELSE
200   PRINT "Info: last dump date
           was ";date
210 ENDIF
220
230 PROCnewdisc(dstdrv$,TRUE)
240 PROCscan(srccdrv$+"$")
250 IF POS>0 THEN PRINT
260 PROCupdate
270 PRINT "Success: dump completed
           OK"
280 END
290
300 DEF PROCccopy(srcc$,dst$,name$,len)
310 LOCAL need,J%
320 REM Find a dump disc with enough
           space, then copy the file
330 REM Assume the worst case extra
           space needed - i.e. all the
340 REM directories need creating
350 PROCdelete(dst$+"."+name$)
360 need = len
370 FOR J% = 1 TO LEN(name$)
380   IF MID$(name$,J%,1)=". " THEN
           need += &800
390 NEXT
400 PROCensure(dst$,need)
410 PROCdelete(dst$+"."+name$) : REM
           disc may have changed
420 PRINT "Info: copying ";name$;
           " size ";len;" from ";src$;
           ;" to ";dst$
430 PROCcpx(srcc$,dst$,name$)
440 ENDPROC
450
460 DEF PROCdelete(file$)
470 REM Forcefully remove the given
           file, if it exists
480 IF FNpeek(file$)=1 THEN
490   PRINT "Info: superseding
           existing file ";file$;
500   SYS "OS_FSCControl",27,file$,
           ,,%0000000010
510 ENDIF
520 ENDPROC
530
540 DEF PROCcpx(srcc$,dst$,name$)
550 LOCAL dir$,nam$
560 REM Create any directories that
           are required, then copy the file
570 dir$ = dst$+"." : nam$ = MID$(
           name$,3)
580 WHILE INSTR(nam$,".")>0
590   dir$ += ". "+LEFT$(nam$,INSTR(
           nam$,".")-1)
600 IF FNpeek(dir$)<>2 THEN
610   PRINT "Info: creating
           directory ";dir$;
620   SYS "OS_File",8,dir$,,0
630 ENDIF
640 nam$ = MID$(nam$,INSTR(nam$,
           ".")+1)
650 ENDWHILE
660 SYS "OS_FSCControl",26,src$+"."
           +name$,dst$+"."+name$,%0000000010
670 ENDPROC
680
690 DEF FNpeek(file$)
700 LOCAL type
710 REM Get the type of the named
           object
720 SYS "XOS_File",5,file$ TO type
```

```

730 IF (type<0) OR (type>2) THEN          1100 UNTIL rootok
                                         type = 0
740 = type
750
760 DEF PROCensure(drv$,need)
770 LOCAL free
780 REM Ensure that the drive has at      1110 IF NOT formatted THEN
                                         least that much free space
790 REPEAT
800   SYS "ADFS_FreeSpace",drv$ TO        1120 PRINT "Confirm: clear out
                                         ,free
                                         this disc (Y/N): ";
810   IF free<need THEN                  1130 IF FNyesno THEN
                                         PRINT ""Wait: clearing
820     PRINT "Warning: not enough        1140 drive ";drv$;"...."
                                         space on ";drv$;" (need "
                                         ;need;", free ";free;")"
                                         1150 PRINT "'Wait: clearing
                                         drive ";drv$;"...."
830   PROCnewdisc(drv$,FALSE)
840 ENDIF
850 UNTIL free>=need
860 ENDPROC
870
880 DEF PROCnewdisc(drv$,first)
890 LOCAL rootok,wrd$,formatted
900 REM Request that another disc is      1160 SYS "OS_FSControl",27,drv$+
                                         mounted
                                         ".$.*",,%0000000011
910 REM If it is blank, format it -      1170 ELSE
                                         otherwise maybe clear it out
                                         1180 PRINT
                                         1190 ENDIF
920 IF first THEN wrd$ = "a" ELSE
                                         wrd$ = "another"
                                         1200 ENDIF
                                         1210 ENDPROC
                                         1220
                                         1230 DEF PROCscan(root$)
                                         1240 LOCAL blk,off,name$,J%,dir,num
                                         1250 REM Traverse a directory
                                         subtree, calling PROCaction
                                         for each object
                                         1260 REM and recursing for each
                                         directory.
                                         1270
                                         1280 DIM blk 40
                                         1290 off = 0
                                         1300 REPEAT
                                         1310   SYS "OS_GPB",10,root$,blk,1
                                         ,off,40,"*" TO ,,,num,off
                                         1320   IF num=1 THEN
                                         1330     J% = 20:REPEAT:J%+=1:UNTIL
                                         blk?J%=0
                                         1340     blk?J%= 13:name$= $(blk+20)
                                         1350     dir = (blk!16=2)
                                         1360     PROCaction(root$,name$,dir
                                         ,blk!,blk!4,blk!8)
                                         1370     IF dir THEN PROCscan(root$
                                         +".+"name$)
                                         1380   ENDIF
                                         1390 UNTIL off<0
                                         1400 ENDPROC
                                         1410
                                         1420 DEF PROCaction(dir$,name$,dir
                                         ,load,exec,len)
                                         1430 LOCAL stamp,copythis,key$
                                         1440 REM Decide whether to copy over
                                         a file
                                         1450 stamp = FNstamp(load,exec)
                                         1460 PRINT CHR$(13); "Scanning: ";
                                         dir$;".";name$;" ",len;"." ";
```

Hard Disk Backup

```
1470 IF dir THEN                                1910      full = FALSE
1480   PRINT "Dir";
1490 ELSE
1500   PRINT FNtype(load);
1510 ENDIF
1520 VDU 23,8,5,6|
1530 IF NOT dir THEN
1540   IF full THEN
1550     copythis = TRUE
1560   ELSE
1570     IF stamp>0 THEN
1580       IF stamp>date THEN
1590         copythis = TRUE
1600       PRINT '"Confirm: copy
1610         this unstamped file (Y/N): ";
1620         copythis = FNyesno : IF
1630           NOT copythis THEN PRINT
1640             IF copythis THEN
1650               PRINT
1660               PROCCcopy(srcdrv$,dstdrv$,
1670                 MID$(dir$+"."+name$,4),len)
1680             ENDIF
1690           ENDIF
1700         ENDPROC
1710 DEF FNyesno
1720 LOCAL key$
1730 REM Accept a Yes or No answer
1740 REPEAT
1750   key$ = GET$
1760 UNTIL INSTR("YNyn",key$)>0
1770 PRINT key$;
1780 = (key$="Y" OR key$="y")
1790
1800 DEF PROCddate
1810 LOCAL type,load,exec
1820 REM Get the last dump date from
1830   the timestamp of the marker file
1840   SYS "OS_File",5,srcdrv$+".$.
1850   DumpDate" TO type,,load,exec
1860 IF type<>1 THEN
1870   full = TRUE
1880 ELSE
1890   date = FNstamp(load,exec)
1900   IF date=0 THEN
1910     full = TRUE
1920   ELSE
1930 ENDIF
1940 ENDPROC
1950
1960 DEF FNtype(load)
1970 LOCAL blk
1980 REM Decode the file type from a
1990   load address (always length 8)
2000 IF (load AND &FFF00000)<>
2010   &FFF00000 THEN
2020     = "
2030     ELSE
2040       SYS "OS_FSControl",18,,,(load
2050         AND &000FFF00)>>8 TO ,
2060         blk!0,blk!4
2070
2080 DEF FNstamp(load,exec)
2090 REM Get file age (in seconds)
2100   from addresses, 0 if not stamped
2110   IF (load AND &FFF00000)<>
2120     &FFF00000 THEN
2130       = ((load AND &000000FF)*
2140         (2^32)+exec)/100
2150
2160 DEF PROCupdate
2170 REM Update the dump date marker
2180   file
2190   SYS "OS_File",11,srcdrv$+".$.
2200   DumpDate",&004,,0,0
2210   PROCddate : PRINT "Info: dump
2220     taken at ";date
2230 ENDPROC A
```

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